No. 3. — *The Carabid Beetles of New Guinea.*[1] *Part 2. The Agonini*[2,3]

By P. J. Darlington, Jr.

CONTENTS

[1] Work aided by grant of a fellowship by the John Simon Guggenheim Memorial Foundation, 1947–48; see page 91.

[2] The first part of this series is not yet published. See text for explanation.

[3] Manuscript received for publication December 20, 1951.

INTRODUCTION

Purpose; sources and disposition of material; acknowledgements. This paper is the first-published part of a taxonomic survey of the Carabidae of New Guinea. The survey should have some value of its own, will give an opportunity for the description of many new species which are on hand, and will make it possible to distribute much identified and paratype material for the use of other specialists, and the survey should yield also a few items of general zoögeographic and evolutionary interest. I have begun the survey with the tribe Agonini rather than with the tribes that come first on the list (the Junk-Schenkling Catalogue) because of my special interest in Agonini and because they form the principal part of the high-mountain carabid fauna in New Guinea.

The material used in this survey consists of three main collections: one made by myself from December 1943 to October 1944, and now in the Museum of Comparative Zoology; one made by Miss L. Evelyn Cheesman in 1933–34, 1936, and 1938 for the British Museum; and one made by Dr. L. J. Toxopeus during the course of the Netherlands Indian-American (Third Archbold) Expedition of 1938–39. My own New Guinean collection was made principally in two places: in the magnificent, diverse lowlands around Dobodura, Papua, during more than four months (March–July) when I was hospitalized there; and on the even more magnificent and diverse Bismarck Range, including 15,400 foot Mt. Wilhelm, which I was fortunate enough to be able to visit for two weeks of leave in October, through the kindness of the Australian administrators ("Angau"). The first set of my material is of course in the Museum of Comparative Zoology; duplicate sets are being widely distributed. Miss Cheesman's material includes a large number of otherwise unknown species, mostly from middle altitudes, from many localities widely scattered over New Guinea and from Japen and Waigeo Islands. This material is, of course, to be returned to the British Museum, except for a duplicate set which goes to the M. C. Z. Toxopeus' material is mostly from the Snow Mountains of Netherlands New Guinea and includes series of many fine species from

high altitudes. This material was received from the Buitenzorg (Java) Museum. The first set of it, including holotypes and uniques, goes to the Leiden Museum; a good set goes to the Museum of Comparative Zoology by special arrangement, involving an exchange with the Buitenzorg Museum; and the balance is to be returned to the Buitenzorg Museum for further division. Besides these main collections I have had for study useful lots from the United States National Museum, the Muséum National d'Histoire Naturelle (Paris), the American Museum of Natural History (New York), the California Academy of Sciences, the Chicago Museum, the Bishop Museum, and the Hawaiian Sugar Planters' Association. (Some of the borrowed material has been from adjacent regions, for comparison, rather than from New Guinea itself.) I have received also either aid or specimens from a number of individuals whom I plan to name at the end of my work on New Guinean Carabidae rather than in the present first installment. All together I have had enough material to give at least clear outlines of the nature, distribution, and relationships of the New Guinean carabid fauna as a whole, a fauna which up to the present has been known in only a most fragmentary way.

This paper has been written at the Museum of Comparative Zoology, but part of the groundwork for it was done at the British Museum, where, as holder of a John Simon Guggenheim Memorial Foundation Fellowship, I spent six months during the winter of 1947–48, studying the fine H. E. Andrewes Collection and other pertinent material in order to get a working knowledge of known Oriental and Indo-Australian Carabidae. I am very much indebted both to the Guggenheim Foundation and to the authorities and staff of the British Museum for this opportunity. I have a working knowledge also of Australian Carabidae, acquired as a result of a year spent in Australia with the Harvard Australian Expedition of 1931–32.

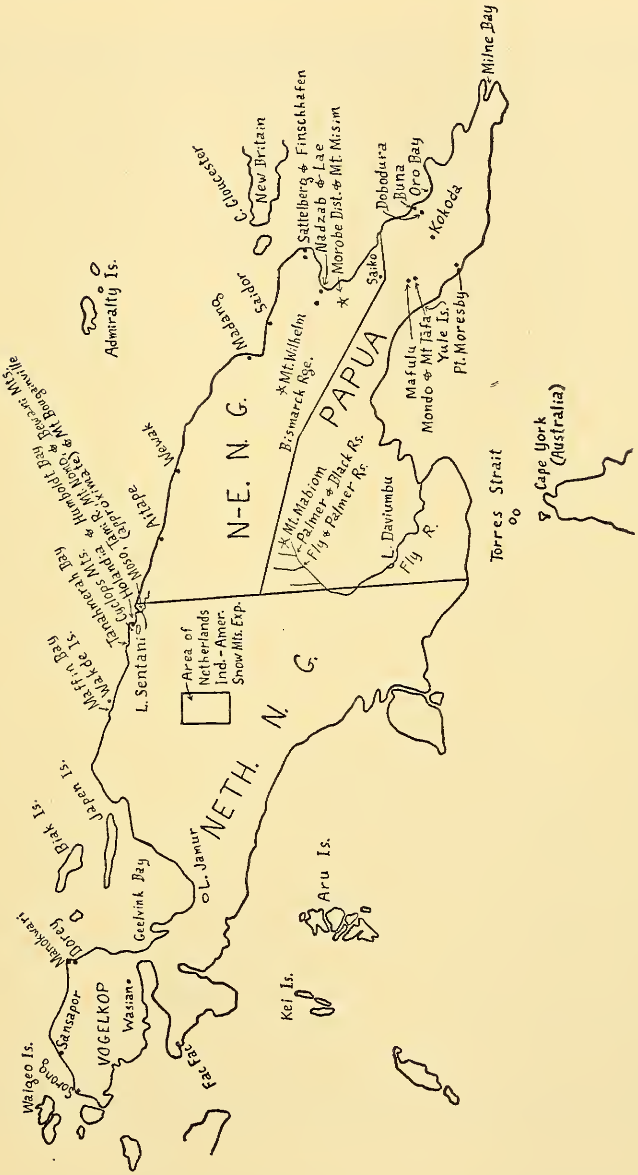
Localities. I see no need, or at least none now, for a formal gazetteer of localities referred to in this paper. They are not very numerous, and I have shown almost all of them on the preliminary outline map on page 93. In order to simplify the map, I have in a few cases not shown exact localities if they occur within definite, circumscribed areas that are indicated. For example I have not shown Miss Cheesman's exact localities in the Cyclops Mountains and on Japen and Waigeo Islands, nor those of Toxopeus in the Snow Mountains, nor mine on the Bismarck Range. Miss Cheesman has written at least two books about her travels in New Guinea, but unfortunately they are out of print and are very hard to obtain. The itinerary of Toxopeus' Snow-Mountain collecting is given by him in *Treubia*, Vol. 17, 1940, pp 271–279. A short gazetteer of localities, which should be useful t

entomologists as well as herpetologists, will be found on pages 310–314 of Arthur Loveridge's recent paper on New Guinean reptiles and amphibians (*Bull. Museum of Comparative Zoölogy*, Vol. 101, No. 2, 1948). In spelling place names I have followed the National Geographic Society's map of Southeast Asia and the Pacific Islands (1944) for English names so far as they are given there, but have used the English rather than the Dutch names for well-known places in the Dutch areas. For example I have called the great mountain range of Netherlands New Guinea the Snow Mountains, not the "Sneeuw Gebergte". I have consistently referred to the three main political divisions of New Guinea as:

Papua
N-E. N. G. (North-east New Guinea)
Neth. N. G. (Netherlands New Guinea)

Methods, measurements, etc. Throughout this work I have used a modern Spencer stereoscopic microscope with, alternately, a two-tube fluorescent microscope lamp and a strong spotlight. I have rarely used a magnification of more than 54× (6 × 9), although the instrument will give 108× (6 × 18). The outline drawings of whole insects have been made under my direction by Mr. F. Y. Cheng, mostly with the use of a squared ocular. The other drawings have been made by myself with a camera lucida, then inked by Mr. Cheng, to whom I am much indebted for his painstaking work.

In drawing up descriptions I have tried to find a satisfactory compromise between the too-superficial work of many earlier authors and the too-laborious methods which, though theoretically desirable, are not practical in faunistic taxonomy. When possible I have based each description on one pair of average-looking specimens of a series, and have referred to the whole series to check only the more important characters. I have in each case made a set of standard measurements on the selected specimens with a micro-ruler in the microscope ocular, and from the measurements have derived three standard ratios of great value in distinguishing species. The ratios are: width of head to width of prothorax (given in the descriptions as head/prothorax, or as head .— width prothorax); width to length of prothorax (given as prothoracic width/length); and width of base to width of apex of prothorax (given as prothoracic base/apex). Width of head includes the eyes. Width of prothorax is greatest width. Length of prothorax is length at middle regardless of whether the anterior angles project forward. Width of base of prothorax is width between basal angles; of apex, between most advanced points of anterior angles. When either basal or anterior angles are obliterated, accurate measurement is impractical and the ratio of base/apex is given as an approximation.


Milne Bay
New Britain
C. Gloucester
Sattelberg
Finschhafen
Nadzab
Lae
Morobe Dist.
Mt. Misim
Dobodura
Buna
Oro Bay
Kokoda
Saiko
Admiralty Is.
Saidor
Madang
Mt. Wilhelm
Bismarck Rge.
PAPUA
Mafulu
Mondo
Mt Tafa
Yule Is.
Pt. Moresby
Cape York (Australia)
Torres Strait
N-E. N. G.
Wewak
Aitape
Mt. Mabiom
Palmer
Black Rs.
Fly
Palmer Rs.
L. Daviumbu
Fly R.
Humboldt Bay
Mt. Bougainville
Bewani Mts.
Mt. Nomo
Tami R.
Hollandia
Moso
Cyclops Mts.
Tanahmerah Bay
Maffin Bay
I. Wakde Is.
L. Sentani
Area of Netherlands Ind.-Amer. Snow Mts. Exp.
NETH. N. G.
Japen Is.
Biak Is.
L. Jamur
Geelvink Bay
Aru Is.
Manokwari
Dorey
Sansapor
VOGELKOP
Wasian
Sorong
Waigeo Is.
Fak Fak
Kei Is.

These ratios must be determined by measurements; they cannot be estimated satisfactorily by eye. It should be remembered, too, that the ratios vary somewhat in any given species and slight variations should not be given too much importance. In each case the specimens on which detailed measurements have been made and of which the proportions are given in the description are indicated in a special paragraph headed "*Measured specimens*". However, my statements of measurements of total length and width (see next paragraph) show the extremes of the entire available series of each species.

The measurements of total length represent specimens in fully extended natural position and include the elytral denticles or spines if present. In the case of specimens not actually fully extended I have measured separately, with a micro-ruler in the microscope, the elytra (from above, with the anterior part of the elytral disc level), the prothorax, and the head, and have added the fractional measurements together. The resulting total lengths are more accurate and more uniform and therefore more significant than those given by most earlier writers on Carabidae. Measurements of width have been made across the closed elytra at widest point. When, as is often the case, the elytra are slightly separated, the width of separation has been subtracted from the measurement. When the elytra are widely separated or warped, width has been given only approximately.

Some further notes on methods are included in the following paragraphs.

Structures and characters: the tribe Agonini. The tribe Agonini (Platynini or Anchomenini) is a well-recognized group, although different authors have set different limits to it. The New Guinean forms of the group are diverse, but all of them seem to be true members of the tribe in a fairly strict sense. They are distinguished from Pterostichini primarily by having the outer elytral margin not interrupted by an inner, subapical elytral plica. This interruption is absent in all Agonini, so far as I know[1]. However, though present and very distinct in most Pterostichini, the interruption is indistinct or absent in at least a few of those of the Australian Region. In doubtful cases the form of the parameres of the male copulatory organs is useful in separating the tribes. In most or perhaps all Pterostichini the left and right parameres are very unequal in size and shape; in all genera of Agonini that occur in New Guinea the parameres, though by no means equal, are much less differentiated (see Figs. 20-66).

[1] Andrewes (*Trans. Ent. Soc. London*, Vol. 78, 1930, p. 40; and *Jour. Federated Malay Museums* Vol. 16, 1931, p. 451) mentions the presence of an internal elytral plica in *Aparupa* and *Idiastes*, both of which I consider true Agonini, but in these cases the plica does not interrupt the elytral margin as it almost always does in Pterostichini.

The following discussion is not a definition of the tribe Agonini but an analysis of some structures and characters of the New Guinean members of the tribe. The generic and specific descriptions of this paper will be modeled on the order of this discussion. Characters normal for a given genus will usually not be repeated under the species.

Form, color, microsculpture. The Agonini of New Guinea vary in size from 4.0 (*Arhytinus granum n. sp.*) to 23.0 millimeters (*Colpodes rex n. sp.*). They vary in form from *Bembidion-*, *Agonum-*, or *Platynus*-like to broadly oval or subquadrate, and in convexity from strongly depressed to very convex or with inflated elytra. A strikingly fusiform shape has been evolved apparently independently in certain (but not all) species of several different genera (*Maculagonum, Iridagonum, Altagonum,* and *Fortagonum*), and a subfusiform or *Amara*-like shape has been evolved in several additional stocks. The color is usually black or brown; less often at least partly, especially on elytra, purple, blue, or green (*Euplenes,* several *Colpodes, Altagonum cheesmani* and *regiscapha,* and *Fortagonum limum*); and rarely the elytra are blue or green with yellow blotches (*Euplenes laetus*) or red tips (*Euplenes apicalis* and *Colpodes laetus*). In *Maculagonum* the elytra, though not metallic, are mottled or blotched with dark and pale. A majority of the species of New Guinean agonines are not iridescent, but a good many scattered through a number of different genera are faintly so at least on elytra in strong light, and a few (especially the species of *Iridagonum*) are strongly iridescent. The upper surface varies in sculpture but is rarely coarsely or extensively punctate. Reticulate microsculpture is almost always present (absent or nearly so only in *Lithagonum* and in *Gastragonum laevisculptum*) but varies in distinctness and in size, shape, and depth of meshes. In the descriptions the microsculpture is said to be normal when the meshes are visible in good light at a magnification of 54×, and when they are isodiametric on head, moderately transverse on pronotum, and equally or more transverse on elytra. Many departures from this normal pattern are described under different species below. Generally speaking, so far as New Guinean Agonini go, characters derived from the microsculpture are of no more than specific and sometimes of less value. In several cases distinct differences in microsculpture separate geographical subspecies which are otherwise indistinguishable or nearly so.

The head in different New Guinean Agonini varies from rather short to more or less elongate, and from slightly less than half as wide to fully as wide as the prothorax. The mandibles are only moderately long and rather strongly curved except in certain species of *Fortagonum* (*forceps* and *cychriceps*) in which they are much longer, more slender, and straighter than usual. The eyes are often large and prominent,

but also often reduced in both size and prominence, and rarely (*Laevagonum citum, Fortagonum cychriceps*) so small and flat as scarcely to break the outline of the sides of the head. In several independent cases the eyes, though much reduced in size, are still more or less abruptly prominent, sometimes abnormally and strikingly so. This is the case in one species of *Notagonum* (*reversior*), one of *Iridagonum* (*subfusum*), one of *Maculagonum* (*setipox*), one of *Gastragonum* (*laevisculptum*), all four species of *Idiagonum*, some *Nebriagonum*, the single known species of *Montagonum*, and some *Fortagonum*, especially *Fortagonum limum*, in which the eyes are not only abnormally abruptly prominent but also set off above from the front of the head by deep channels. More or less similar, small but very abrupt "popped" eyes occur in some other Oriental Agonini, including the genotype of *Colpodes* (*brunneus* Macl.), some other species of *Colpodes* (*aeneipennis* Dej., *sjostedti* Andr., and *latus* Louwerens), and all three species of the Himalayan genus *Aparupa* Andr. The eyes are not equally abrupt in all of the New Guinean forms listed above, but in each case they are much more so than in closely related forms. This peculiar modification of the eyes may be an adaptation, but it seems more likely that it is merely a secondary mutational effect which occasionally, but not usually, accompanies reduction of eyes, and which is obviously not necessarily of much phylogenetic significance. The usual two supraocular setae are present above each eye in most New Guinean Agonini. The posterior pair of the setae is about between the posterior edges of the eyes when the latter are normally large and prominent, but more or less behind the level of the posterior edges of the eyes when the latter are much reduced. This is a useful taxonomic character in some cases. The anterior supraocular setae have been lost in three probably independent cases: in one species of *Iridagonum* (*subfusum*), one of *Nebriagonum* (*percephalum*), and the entire genus *Fortagonum;* and in *Fortagonum bufo* the posterior as well as the anterior supraocular setae have been lost. It should be added that, in the case of *Nebriagonum percephalum*, although the anterior supraocular setae are absent in eleven specimens, the right anterior seta (but not the left one) is present in the twelfth specimen. Of course in the case of these and other fixed setae the setae themselves are often broken off, but their position is shown by strong punctures. The punctures as well as the setae are absent in the cases listed above. The antennae of different New Guinean Agonini vary in length and thickness of segments, but are always more or less normal in structure, with dense pubescence beginning near the base of the fourth segment. I have not taken taxonomic characters from the antennae and have usually not mentioned them in the descriptions. The neck in some cases is and in

others is not impressed above. The front is usually more or less evenly convex with a pair of variable but usually slight anterior impressions. I have called this condition normal; variations from it are noted in the descriptions. The mentum is usually toothed, but the tooth is absent in *Arhytinus* and is either absent or broken off in one species of *Colpodes* (*sinuicauda*, represented by two specimens, both of which lack a mentum tooth). When present, the mentum tooth is triangular, varying in exact form in different species, with the apex pointed, rounded, more or less truncate, or slightly emarginate. Some of this variation occurs within single species as well as between species. In general I have not found the form of the mentum tooth useful in taxonomy of New Guinean Agonini, and I have usually not mentioned it in the descriptions. This is true also of the other mouth parts. In general I have not found them useful in the present study, and I have therefore omitted them from the descriptions.

The prothorax in different New Guinean Agonini varies greatly in form, proportions, and other details. No general discussion of the details is necessary except in the case of the lateral pronotal setae. There are normally two setae on each side of the pronotum, on or near the lateral margin, one (the anterior-lateral seta) near or before the middle of the prothoracic length, the other (the posterior-lateral seta) at or near the base. Both pairs (anterior and posterior) of these setae are uniformly present in the first eight genera (through *Plicagonum*) here treated, in all the species of *Gastragonum* and *Idiagonum*, and also in *Maculagonum setipox* and most specimens of *Nebriagonum cephalum*, although all the other species of the two last-named genera have lost one or both pairs of the setae. One or both pairs are absent also in all New Guinean Agonini not named above. A few have lost the posterior-lateral setae but not the anterior-lateral ones (*Lithagonum*, some specimens of *Nebriagonum cephalum*, and both known specimens of *Laevagonum subcitum*). More often the anterior but not the posterior pair has been lost (*Iridagonum*, most *Altagonum*, most *Maculagonum*, *Montagonum*). And in the remaining cases both pairs of the setae are lost (*Altagonum nudicolle* and *fatuum*, *Potamagonum*, most *Nebriagonum*, most *Laevagonum*, all *Fortagonum*). The preceding lists suggest what is certainly the case, that presence or absence of one or both pairs of lateral pronotal setae is not necessarily of itself an important taxonomic character. In fact in *Nebriagonum cephalum* the posterior-lateral setae are present or absent, or sometimes present on one side only, in different specimens of the type series. Nevertheless, in many other cases presence or absence of these setae does give a useful "tag" for the identification of species or genera. These setae, like the supraocular ones, are often broken off, but then their former

presence is shown by characteristic punctures which are absent when the setae have failed to develop. A formula for indicating presence or absence of the standard supraocular and lateral pronotal setae is described below, under the heading "Evolution". The disc of the pronotum is described as normal when it is moderately convex and has a more or less impressed, more or less abbreviated, fine, median longitudinal line, and two less sharply defined but distinct transverse impressions near the apex and base respectively. The actual apex and base sometimes are and sometimes are not margined by fine impressed lines.

The elytra of different New Guinean Agonini differ greatly in form and proportions, and also in many details which yield good taxonomic characters. The elytral disc is in some cases regularly convex and in others more or less impressed before the middle. This character is surprisingly constant in some species and is useful especially in superficial recognition of certain *Notagonum*. The bases of the elytra are usually entirely margined to or nearly to the scutellum, but the margin is incomplete inwardly in a few cases (*Tarsagonum, Colpodes acuticauda, Idiagonum, Fortagonum cychriceps*). At the humeri the marginal line is in some cases rounded and in others angulate, the angles being obtuse, right, or acute in different cases; generally speaking the angles are rounded or obtuse in species with normally formed elytra, more nearly right or acute in those with elytra oval or the whole body oval. The lateral margins or gutters of the elytra vary in width in different species. The lateral margins posteriorly, just before the subapical sinuations, are usually rounded, but in a few cases are abruptly angulate or even with very short spines (*Notagonum externum, Colpodes saphyrinus sloanei, Colpodes antedens*). The subapical sinuations are usually moderate or strong but in some cases slight or absent. The form of the subapical sinuations, or their absence, is usually a specific rather than a generic character, although it is more or less constant in some small genera. The apices themselves vary extremely in form (conjointly or independently rounded, subtruncate, angulate, or slightly produced), and are dentate or spined in a number of taxonomically diverse species. Well developed spines occur in *Tarsagonum latipes; Notagonum subrufum* and *spinulum; Colpodes violaceus, saphyrinus sloanei*, and *antedens; Altagonum tutum, cheesmani*, and some specimens of *scapha*; and shorter spines occur in some other species, including some specimens of *Potamagonum diaphanum* and *Nebriagonum arboreum*. Spines seem to have been evolved *independently* in each of the species named. The apical elytral spines vary in position in different species; they may be opposite the ends of the fourth, third, second, or sutural intervals. The sutural angles of the elytra are only

rarely actually spined but they are very often denticulate, the denticles being in some cases prominent and in others inconspicuous. Sometimes the denticles vary in development or are even present or absent in single populations. Also, they sometimes vary with angle of view. When the denticles are only slightly developed they are likely to appear distinct if seen from in front of the perpendicular, indistinct if seen from farther back. Among the Agonini of New Guinea the presence or absence of these denticles is often useful to distinguish species, but rarely genera. The character is obviously one which should be used with discretion. The striation of the elytra is entire or nearly so, and the sutural striae are long, in all New Guinean Agonini. The striae are usually impunctate or nearly so, rarely coarsely punctate. In some cases the edges of the striae are slightly irregular although no distinct punctation can be distinguished. In these cases I have described the striae as "not distinctly punctate" or "indistinctly punctulate". The striae vary in depth, and the intervals, therefore, in convexity. The outer intervals, especially the eighth and ninth and sometimes also the seventh, are in some cases variously modified toward apex. In most cases they end or fuse without noteworthy modification other than a moderate narrowing of the eighth and widening of the ninth interval toward apex. In these cases I have described these intervals as "not much modified toward apex". In other cases their form is described in detail. The eighth and to a less extent the seventh intervals are sometimes much compressed toward apex (*Colpodes bennigseni*), or longitudinally impressed or sulcate (*Tarsagonum latipes, Colpodes acuticauda,* all species of *Iridagonum* except *quadripunctellum, Altagonum pallinox, A. sphodrum* etc., and some specimens of *Fortagonum fortellum*). The ninth or normal submarginal interval, which is usually somewhat widened (and more or less interrupted) toward the apex, is sometimes abnormally narrow and convex, or longitudinally impressed. In certain cases the marginal channel itself is more or less modified especially posteriorly, being sometimes abnormally wide and flat (*Fortagonum cychriceps*) or with its inner part swollen and forming posteriorly a more or less distinct extra or tenth interval. Such a partial or fragmentary tenth interval is characteristic of the entire genus *Idiagonum* and is more or less developed in several species of *Fortagonum. Fortagonum fortellum* is remarkable for the variation of its outer elytral intervals, which are sometimes not much modified toward apex, sometimes strongly longitudinally impressed; and in this species a short but well defined fragment of an extra tenth interval is present in some specimens but not in others (these variations are all in one series from a single small strip of mountain forest). The third elytral interval normally has

three dorsal punctures, each bearing a rather inconspicuous seta. The punctures are usually more or less evenly spaced along the length of the elytron, about ¼ from base, near middle, and about ¼ from apex; the first is usually near the third stria, the others, near the second one. When the punctures are arranged in about this way, the third interval is said in the following descriptions to be normally 3-punctate. Many departures from the normal condition, involving differences in position of, or loss of one, two, or all of the punctures, are noted in the descriptions of different species. In some cases loss of one or more punctures is a constant character useful in defining species. For example in the first species-group of *Altagonum* and in *Iridagonum* some species have the third elytral interval always 3-punctate, others, always 2-punctate, with the anterior puncture missing. In other cases, however, the occurrence of punctures on the third interval is extremely variable in single species (see descriptions of *Nebriagonum cephalum* and *Fortagonum fortellum*).

The inner wings vary in New Guinean Agonini, being in some cases fully developed, in others vestigial. I am well aware that such variation is often of little importance among Carabidae. However it so happens that in New Guinea there is only one agonine genus in which the wings are variable. This is *Gastragonum*, which includes species which, so far as my material goes, are fully winged, others which are vestigially winged, and one (*terrestre*) which is dimorphic. In every other genus here treated the wings are either uniformly full or uniformly vestigial in all my New Guinean material. Under these circumstances the state of the wings becomes a very useful taxonomic character. When the wings are vestigial, the metepisterna are often more or less shortened. This character has been overstressed in the past, especially in classifications of *Colpodes*. I shall use it very little here.

The lower surface is usually impunctate or virtually so in New Guinean Agonini, except of course for the presence of certain "fixed" setigerous punctures, but in a few cases the lower surface is more or less extensively punctate especially at the sides. The abdomen usually lacks pubescence other than fixed setae, but in about ten separate cases scattered pubescence is present either localized on some part of the abdomen (usually near middle of base) or over much or all of it. The cases are: (1) *Arhytinus*, in which scattered pubescence seems to be confined to the last ventral segment of the female only; (2) *Notagonum angustellum*, *subnigrum*, and *vile*, in which the abdomen is extensively pubescent, though not equally so in all the species named; (3) *Notagonum externum*, with a very little fine pubescence near middle of abdomen; (4) *Notagonum sinuum* and *vaporum*, in which abdominal

pubescence is again extensive; (5) *Notagonum subimpressum*, in which the pubescence is slight and mostly near the middle; (6) *Colpodes acuticauda*, with a little fine and irregular pubescence; (7) *Lithagonum*, with abdomen rather variably and sparsely pubescent; (8) *Altagonum pubinox, pallinox, noctellum*, and *planinox;* (9) *Altagonum sphodrum* and *postsulcatum*; (10) *Gastragonum laevisculptum*. I think that pubescence has appeared on the abdomen *independently* in most or all of these ten cases. The prosternal process in New Guinean Agonini is as a rule simple: not margined nor tuberculate at tip, not setose, and with the posterior declivity not strongly compressed, though sometimes moderately so. Exceptions to this rule are noted in the descriptions. The principal exceptions are that the tip of the prosternal process is margined or tuberculate in *Tarsagonum latipes* and *Fortagonum bufo*, and setose in all four species of *Idiagonum*. The mesepimera are usually very narrowly triangular, but are somewhat wider, with outer margin about one-half as long as the anterior one, in *Euplenes*. This is correlated with and probably a result of evolution of a rather broad and depressed body-form in *Euplenes*. The metepisterna vary with the state of the wings, and have already been mentioned in that connection.

The legs are more or less normally formed in all New Guinean Agonini but vary in many details, of which I shall mention only those found useful in taxonomy in the present paper. It is likely that many other details, including the presence or absence of certain setae on the femora and the clothing of the lower surface of the tarsi, may eventually prove of great taxonomic value, but they may perhaps be more profitably studied in some connection other than the present one, preferably in the course of a world-wide classification of agonine genera. The following discussion is, for practical reasons, limited to the hind tibiae and tarsi and applies to the Agonini of New Guinea only. The hind tibiae are deeply sulcate along their extreme outer edges in *Tarsagonum* only. The hind tarsi, though variable, are usually more or less slender, but are somewhat wider than usual and symmetrical in *Euplenes*, and wide and asymmetrical in *Tarsagonum*. The first three or four segements of the hind tarsi are usually more or less grooved on each side above. The presence or absence and the depth of the grooves can be used in taxonomy, but the characters are difficult both to see and to describe accurately, and I have therefore usually avoided them here. They have been much over-used in the past. The form of the fourth segment of the hind tarsi is variable and is important in agonine taxonomy, though not so important as it has been thought to be. This segment may be simply emarginate at apex or with short or moderate or long apical lobes below (see Figs. 16–19). When lobes are present, the outer one is usually longer than the inner,

but the two are nearly equal in *Euplenes*. In observing the shape of the fourth hind-tarsal segment, great care should be taken not to mistake a middle tarsus for a hind one and to see both sides of the fourth segment clearly so as not to overlook a lobe that may be hidden below the base of the fifth segment. There is a definite correlation between the form of the fourth hind-tarsal segment and the habitats or habits of different agonines. The segment tends to be simply emarginate in ground-living species, lobed in arboreal species and in those that live beside running water, but there are many exceptions to this general rule. As might be expected in view of the apparently adaptive nature of its modifications, the fourth hind-tarsal segment is not really fundamental in agonine taxonomy. The shape of this segment does not, or at least not usually, define large and diverse genera such as *Colpodes*, although it is more or less constant in many smaller genera. In the New Guinean genera, the fourth hind-tarsal segment is emarginate in *Arhytinus*; strongly but very asymmetrically lobed in *Tarsagonum*; strongly and symmetrically lobed in *Euplenes;* asymmetrically lobed in *Dicranoncus*; emarginate in *Lorostemma*; variable (emarginate in several stocks and more or less lobed in several others) in *Notagonum*; variable also in *Colpodes*, briefly lobed in *Plicagonum*, rather briefly lobed in *Lithagonum*; emarginate in *Iridagonum*; usually simply emarginate in *Altagonum* but with short lobes in four species which are probably not directly related to each other (*caducum, chcesmani, scapha, nudicolle*); emarginate in *Maculagonum*; briefly lobed in *Potamagonum*; variable in *Gastragonum*; emarginate in *Idiagonum*; variable in *Nebriagonum*; emarginate in *Laevagonum*; emarginate in *Montagonum*; and variable in *Fortagonum*. I give this list in full to emphasize the variability of this character so far as New Guinean agonines are concerned. The fifth segment of the hind tarsi sometimes does and sometimes does not have a row of conspicuous "accessory setae" on each side of its lower edge. The presence or absence of these setae is an important taxonomic character, but it again is not so important as has been thought. The setae are absent or only rudimentary in most New Guinean agonines but are more or less obvious in a few: *Euplenes*, (*Dicranoncus*), two *Colpodes* which are probably not directly related to each other (*s. sloanei, antedens*), *Potamagonum*, and some *Nebriagonum* (see notes under this genus). Their somewhat erratic occurrence and the fact that they are not equally developed in the different forms listed show that presence of obvious accessory setae on the fifth hind-tarsal segment is not necessarily a character of full generic value. This conclusion is reinforced by another fact. Although only a few of the New Guinean species of the tribe have the accessory setae well or even moderately well de-

veloped, very many of the species, perhaps even most or all of them, have the setae present in a rudimentary form, as very short, fine hairs barely visible in clean specimens at 54× with good light. I do not know whether these minute hairs are vestiges indicating the presence of longer setae in the ancestral stocks from which most or all existing New Guinean agonines have been derived, or whether they are parts of minute sensory organs or other structures normally present in Agonini, from which larger setae may be evolved. In either case the presence of minute hairs in so many forms lessens the significance of the occurrence of more or less enlarged setae in a few forms. The tarsal claws are simple in all the agonines now known from New Guinea, but each claw has an acute tooth below at base in *Dicranoncus*, of which one species may occur on the island. The sole of the first four hind-tarsal segments is variably clothed or margined with hairs or bristles in different Agonini, and the variations will probably be useful in taxonomy, but I have not attempted to use them in the present paper, except as an aid to distinguishing *Lorostemma* from *Notagonum*.

The secondary sexual characters of New Guinean Agonini are in general those which are normal for the tribe in other parts of the world: the front tarsi are slightly dilated in the male, with the first three segments biseriately squammulose beneath; and the last ventral segment bears one seta on each side in the male, two on each side in the female. The modification of the front tarsi of the male occurs in all New Guinean Agonini so far as my material goes. However there are a few exceptions to the normal in occurrence of ventral setae: in *Notagonum altum* the female usually has only one seta on each side of the last ventral segment, like the male; in *Colpodes rex*, the male has one, the female usually three such setae on each side; and in *Lithagonum* the male has usually two or more (not one) and the female usually four or more (not two) setae on each side. Two other, minor external sexual differences appear in single genera of New Guinean agonines. In *Arhytinus* the last ventral segment is glabrous in the male (except for the conspicuous setae mentioned above), sparsely and inconspicuously pubescent in the female. And in *Maculagonum* the last ventral segment is moderately or strongly emarginate at apex in the male, entire in the female. This character appears also in a less marked form in a few other species of New Guinean agonines, but in most cases the last ventral is entire or nearly so in both sexes.

The male copulatory organs of some Agonini present good characters which define major groups within the tribe. In certain genera which do not occur in New Guinea (*Calathus, Sphodrus*, etc.) the right paramere is distinctively long and slender, not relatively short and spatulate

as it is in *Agonum* (*cf.* Jeannel, *Faune de France, Coléoptères Carabiques*, Part 2, 1942). However, I have found no such obvious group character among New Guinean agonines, all of which have copulatory organs of the general *Agonum* type, with the right paramere more or less smaller than the left one, both being simply oval or spatulate. There are many small variations in the form of the apex of the middle lobe which, after adequate study of series to determine individual variation (which is sometimes considerable), might be used to define species, and there are also differences in the armament of the internal sac which, in different New Guinean agonines, may bear a conspicuous hook (*Tarsagonum latipes*), or a few or many small spines (*Arhytinus major, Notagonum reversior, Colpodes antedens,* and others), or thickened areas (*Plicagonum rugiceps*, etc.), or (most commonly) no conspicuous armament but inconspicuous areas of minute bristles or granules. There are undoubtedly specific and generic characters to be found in these differences, although they are not always so important as they seem at first glance. However, I have not tried to use them here. To study them properly would require too much time in proportion to the probable results so far as the classification of the Agonini of New Guinea alone is concerned. Other characters are so numerous and so good among New Guinean agonines that the genitalic ones are hardly necessary. The basic genitalic characters of different groups of Agonini should be worked out as part of a study of the phylogeny and classification of the tribe for the whole world. Some day I hope to make such a study. In the meantime, I do not know which of the many details of the agonine copulatory apparatus should be stressed in drawings and I do not know from what angle the drawings had best be made, so the labor of drawing every species now might be wasted. However, for the information of specialists, I have figured (Figs. 20–66) the male copulatory organs of at least one species of each genus treated, of genotypes of all new genera except *Maculagonum* (of which another species is figured), of all new species of which only one male is known, and of a few other noteworthy species.

It is to be hoped that specialists will not make a habit of describing new forms of Agonini based only on small genitalic differences and especially not on differences which appear between my figures and their specimens. The figures have been made carefully, with a camera lucida, but they are not perfect. Carabid copulatory organs are very difficult to figure definitively. Some details are entirely without significance. For example, the dorsal (convex) profile of the middle lobe varies with the position of the movable internal sac. Many other details seem different from different points of view. This is especially true of the parameres, which are often not flat but curved or warped

so that their outlines vary with angle of view; and whether or not the basolateral forks of the parameres are visible depends on angle of view. The armament of the internal sac is even more difficult to show accurately, especially when (as is usually the case) the sac is not everted. Even when small genitalic differences do exist between specimens, their significance is often doubtful, for the male copulatory organs do vary in some species. Almost more than any other parts of the body, the male copulatory organs of Carabidae should be studied and their variations understood before they are used in taxonomy.

After the two preceding paragraphs were written, I discovered that the position of the internal sac of the male copulatory organs varies with the way the specimens are killed. If they are killed dry, by fumes of acetic ether for example, the sac is usually fully retracted within the middle lobe. In this position, the sacs of different specimens can be compared in detail. If the insects are killed in alcohol, however, as my New Guinean ones were, the sac is often partly but not completely everted, and more so in some specimens than in others. Under these conditions it is difficult or impossible to compare the sacs of different specimens properly. This is a very serious disadvantage of alcohol-killed material. It could probably be overcome by dry-killing the insects and then preserving them in alcohol.

Measurements of total length and of width, which are given at the beginning of the generic descriptions and at the end of the specific ones, have already been discussed above.

Genera; nature of the New Guinean agonine fauna. So far as the Agonini of New Guinea are concerned, there are no characters which, of themselves, are always of generic value. The preceding discussion should have made this fact clear. The basic criterion which I have tried to use for genera is actual relationship, as shown by a sum of characters. In practice I have usually treated as genera groups of species which seem to be closely related among themselves but much less closely related to any other species and all of which share at least two distinctive characters, one of which may be a distinctive form or appearance. In some cases I have given weight to continuity of variation; that is, I have included in one genus species which are very unlike if the differences between them are bridged by a more or less continuous series of intermediate species. A good example of this is discussed in the notes under the genus *Nebriagonum*. In a few cases I have made monotypic genera for single species which are very strongly characterized.

Use of these practical criteria has resulted in recognition of nineteen genera of Agonini in New Guinea, including one (*Dicranoncus*) which is not actually recorded from the island but probably occurs there.

Four of the nineteen are previously known, small, natural genera which are primarily Oriental in distribution. These are *Arhytinus*, *Euplenes*, *Dicranoncus*, and *Lorostemma*. Three others are genera of convenience, each containing a number of species not necessarily all related to each other but not sufficiently characterized to be set apart in separate small genera now. One of these genera of convenience is the well known *Colpodes*, here used in a somewhat restricted sense. The other two I am calling *Notagonum* (southern *Agonum*) and *Altagonum* (alticoline *Agonum*) respectively. The remaining twelve genera are new, small, apparently natural groups all of which are probably confined to New Guinea (one or two reach also adjacent small islands) and most of which are confined to the mountains of the island.

It is obvious that in general this fauna consists of three elements. First are several stocks which are shared with and in most cases probably derived from the Orient, including not only the four small genera first named above but also several stocks of *Colpodes* and possibly some of *Notagonum*. Then comes a mass of species (most of those of the composite genera *Notagonum* and *Altagonum* and some *Colpodes*) which, though not strongly enough characterized to form separate small genera now, represent stocks which are more or less endemic to New Guinea and which are apparently in the early stages of differentiation and radiation there. Finally there are the twelve smaller, endemic genera, most of which are probably derived directly from the composite groups but which are more differentiated and some of which have radiated on New Guinea or even on single mountain ranges of the island. This whole picture is clearly one of accumulation of a rather limited number of stocks apparently partly (but perhaps not wholly) from the Oriental Region, of preliminary differentiation and adaptation to different lowland and mountain habitats, and finally of evolution and radiation of a considerable number of more distinct endemic groups which I have called genera. As to when the different stocks reached New Guinea, about all that can be said is that they have probably arrived at different times. Some probably came long ago (but not necessarily all at the same time) but whether they arrived in the Tertiary or before it can hardly be said in the absence of a fossil record. Some others have probably come more or less recently. Some of them are still only specifically or subspecifically different from Oriental forms, and in two cases (*Colpodes lactus* and *C. bennigseni*) I have found no significant differences between Oriental and New Guinean specimens.

Two facts of general interest arise from this brief discussion of the New Guinean agonine fauna. The first is that the whole fauna of nineteen genera and one hundred and twenty-one species and sub-

species is derived from comparatively few ancestors which have come, at least partly from the Orient, at different times, some of them probably very recently. The other fact of general interest is that the mountain agonines — and Agonini are the most numerous Carabidae on the higher mountains of New Guinea — seem to have evolved more or less in place, and at least in most cases to have been derived from stocks which still occur at lower altitudes in New Guinea. In other words, the mountain agonine fauna is in its origins an endemic one, not a relict one.

Evolution: loss of wings and setae; wing and seta formulae. Certain definite evolutionary trends are distinguishable among New Guinean Agonini, especially one toward loss of wings and of certain setae especially in mountain environments. I have discussed the adaptations of mountain Carabidae elsewhere (*Ecological Monographs*, Vol. 13, 1943, pp. 37–61), and have suggested (p. 39 of the paper cited) the terms + winged (+w) (plus-winged) and − winged (−w) (minus-winged) for Carabidae with and without fully developed wings, and ± winged (±w) (plus- or minus-winged) for dimorphically winged forms; and +'s and −'s can be used also to indicate presence or absence of the most important standard setae and dorsal elytral punctures of Agonini: the two pairs of supraocular setae, two pairs of lateral prothoracic setae, and three setigerous punctures of the third elytral interval. By arranging the signs in the order just given, formulae can be made up for the state of the wings and setae in different cases. For example in *Notagonum* and other genera in which the wings are always fully developed and all the standard setae and punctures are always present, the formula is +w, + +, + +, + + +. In *Allagonum*, in which the wings are always fully developed, both pairs of supraocular setae always present, the anterior-lateral pronotal setae always absent and the posterior-lateral ones usually present but sometimes absent, and the punctures of the third elytral interval usually present but all sometimes absent, the formula is +w, + +, −(+), (+) (+) (+). The signs in parentheses show the normal condition in the genus; the parentheses indicate that exceptions occur. The ultimate stage in loss of wings and setae is reached in one species of *Pentagonum* (*bufo*) in which the formula is −w, − −, − −, − − −. The following list of genera of New Guinean Agonini is arranged as nearly as possible according to presence or absence of fully developed wings and setae. The list is phylogenetic, but only in a very general way. The actual evolution of the agonines in question must have been very complex, with many separate lines, and much parallelism or convergence of different lines. The taxonomic part of this paper will follow the order of this list. The list applies to the New Guinean fauna

only. In some cases (*Dicranoncus, Colpodes*) the formulae given do not hold for certain species of the same genera outside of New Guinea. In some cases I shall abbreviate the formulae to show presence or absence of the standard setae of the head and pronotum only. For example the abbreviated formula ++, −− indicates that both pairs of supraocular setae are present, both pairs of lateral pronotal ones, absent.

Table 1: Genera of Agonini of New Guinea

Number of species plus additional subspecies (*e.g.* 25+5) in each genus given in parentheses; state of wings and presence or absence of standard supraocular and lateral pronotal setae and setigerous punctures of third elytral interval shown by formula described in text; principal altitudinal occurrence of each genus indicated.

Arhytinus	(3)	+w, ++, ++, +++	lowlands
Tarsagonum	(1)	+w, ++, ++, ++−	lowlands
Euplenes	(2)	+w, ++, ++, +++	lowlands and mountains
(*Dicranoncus*)	−	+w, ++, ++, +++	(lowlands)
Lorostemma	(1)	+w, ++, ++, +++	lowlands
Notagonum	(25+5)	+w, ++, ++, +++	lowlands, some in mountains
Colpodes	(11)	+w, ++, ++, (+) (+)+	lowlands and mountains
Plicagonum	(2)	+w, ++, ++, (+)++	mountains
Lithagonum	(1+4)	+w, ++, +−, +++	lowlands and mountains
Iridagonum	(4)	+w, (+)+, −+, (+)++	lowlands and mountains
Altagonum	(24+4)	+w, ++, −(+), (+) (+) (+)	mountains, few in lowlands
Maculagonum	(6+1)	+w, ++, (−)+, −(+)+	mountains
Potamagonum	(1)	+w, ++, −−, +++	mountains
Gastragonum	(6)	±w, ++, ++, +++	mountains
Idiagonum	(4)	−w, ++, ++, −−−	mountains
Montagonum	(1)	−w, ++, −+, +++	mountains
Nebriagonum	(6)	−w, (+)+, (−) (−), (−) (−) (−)	mountains
Laevagonum	(4)	−w, ++, (−)−, −−−	mountains
Fortagonum	(5)	−w, −(+), −−, (−) (−) (−)	mountains

Reduction of eyes; tarsal lobes. Besides a strong tendency toward atrophy of wings in mountain habitats, often followed by changes in shape of the elytra and shortening of the metepisterna, and besides the tendency toward loss of setae especially, but not exclusively, in mountain habitats, the Agonini of New Guinea show also tendencies toward reduction of eyes and toward loss of the lobes of the fourth hind-tarsal segment. The eyes have been much reduced only in mountain-living forms and usually, but not exclusively, in flightless ones. As the eyes have become smaller they have usually become also

either flatter or more abruptly prominent, as already described above. The evolution or devolution of the tarsal lobes is harder to reduce to simple terms, partly because the condition of the lobes in the ancestral stocks is unknown. In some cases the lobes may have been enlarged rather than reduced during evolution of New Guinean groups. However it is certainly true that the fourth hind-tarsal segment is more or less lobed in the majority of lowland agonines in New Guinea and simply emarginate in the majority of mountain ones, and it seems safe to say that the general tendency has been toward loss of the lobes in mountain habitats.

Adaptive nature of evolutionary trends. All these tendencies are probably adaptive and, although I have stated them simply, they are probably very complex in fact. This is surely true of the atrophy of wings of mountain Carabidae, which I have discussed elsewhere (*op. cit.*). The wings may sometimes be lost because of direct selection against flight on mountain tops, but their loss is probably also often a complex adaptation to existence of small, dense populations in isolated, small, stable, cool, mountain areas. Actually, although the wings have probably atrophied in the past in several different groups of New Guinean Agonini, they seem rarely to have done so recently, for the wings are either uniformly fully developed or uniformly vestigial in every New Guinean agonine genus except *Gastragonum*. This is in striking contrast to the state of affairs among the Carabidae of the north-temperate zone, where wing dimorphism is much more common within genera and even within species, and where the dimorphism probably reflects the recent instability of climate and habitats. The relative stability of the climate of New Guinea is probably one of the factors that account for the relative stability of the wing-state of Carabidae there.

Loss of setae by Agonini is correlated with and evidently somehow a result of life in mountain habitats. A loss of setae like that which has occurred among the Agonini of New Guinea has occurred also among those of the mountains of the West Indies and among those of the mountainous Hawaiian Islands. So far as the wings and setae alone are concerned, the parallelisms between the New Guinean and West Indian agonines are striking, although in most cases there is obviously no direct relationship. In the West Indies as in New Guinea the formulae for different agonines vary from +w, ++, ++, +++ to (in "*Colpodes*" *puncticeps* Darl.) −w, −−, −−, −−−; and many forms show intermediate conditions, having lost either the anterior or the posterior or both pairs of lateral pronotal setae and in some cases also the anterior supraocular setae. Why mountain-living Agonini should so often lose these setae I cannot satisfactorily explain.

The setae are probably tactile, and the best guess I can make about their loss is that they tend to be lost when the need for them is lost. Possibly the setae are warning devices, useful where enemies such as ants and lizards are numerous, but which tend to lose their usefulness and to be lost in places, like high mountains, where ants, lizards, or other enemies are relatively few.

Reduction of eyes is apparently related to and perhaps a result of reduced activity and, often, loss of the power of flight. At least there is a strong general correlation, though not a complete one, between reduction of eyes and atrophy of wings in all Carabidae. Reduction of the tarsal lobes is presumably also adaptive, resulting perhaps from abandonment of arboreal or stream-side habitats or from reduction of activity or of speed of running.

Parallelism and convergence. Since the main evolutionary tendencies of New Guinean Agonini are at least in part adaptive, it is not surprising to find much parallelism or convergence in them. The wings, though more stable than in some north-temperate Carabidae, have probably atrophied several times in different groups of New Guinean agonines, and resulting changes in shape of elytra and shortening of metepisterna have probably occurred several times too. Loss of setae has certainly occurred independently many times. The eyes have been reduced many times, and the reduced eyes have assumed an abnormal prominence in about eight separate cases among New Guinean Agonini alone. The lobes of the fourth hind-tarsal segment seem to have undergone multiple evolution and atrophy too, although the details are not easy to trace. There is rather striking parallelism also in some other characters which are obviously or presumably adaptive: for example in body form (strikingly fusiform in isolated species in four different genera), in development of spines at apices of elytra (probably developed independently in at least eleven cases in New Guinean Agonini), and development of ventral abdominal pubescence (present in ten probably independent cases). It will be seen, as I have already intimated, that some of these parallelisms occur in characters that have been given great value — too great value — in past classifications of Agonini. For example the presence of lobes on the fourth hind-tarsal segment has long been used as a principal character to define *Colpodes*. The length of the metepisterna has been used as a principal character to divide *Colpodes* into major groups. And the presence or absence of fully developed wings and of supraocular and/or lateral pronotal setae has been taken as *of itself* of generic value among Hawaiian and some other Agonini. It can hardly be reiterated too often that none of these characters is necessarily important of itself. In each of the cases just cited the use of these characters has resulted

in the making of unnatural, composite genera or groups within genera. The use of such composite "genera of convenience" was and in some cases still is excusable as a necessary stage in classification, but it is time that the composite groups were recognized for what they are, and so far as possible genera should be natural. They should be based on actual relationships as shown by the sums of many characters of which certain ones should be stressed, not because of their inherent importance, but because they do hold in a given case, so that they are convenient tags for identification.

Role of geographical isolation. Geographical isolation, or separation of different circumscribed populations, has obviously been important in speciation of Agonini in New Guinea. In fact I am convinced from personal acquaintance with many groups of Carabidae in several parts of the world that geographical isolation is almost always a prerequisite for multiplication of species in this family. This is shown by the usual pattern of distribution of closely related species, which usually occur in separate but neighboring areas, and also by the distribution of incipient species, or subspecies. The latter appear to be primarily geographical among Carabidae. Different populations or subpopulations which are indistinguishable except in one or two minor characters, and which sometimes intergrade even in those, seem always to inhabit separate areas. The subspecies is of course now usually defined as a geographical form, so that non-geographical variants cannot properly be called subspecies in any case, but this is beside the point. The point is that among New Guinean Agonini, and among Carabidae in general, populations that differ more or less constantly but only slightly from each other apparently always or almost always do occur in different areas rather than in different habitats in the same area. Among New Guinean Agonini, for example, I have recognized as subspecies a number of forms characterized only by slight but more or less constant differences in size, or proportions, or color, or iridescence, or microsculpture. These forms are all geographical. They occur in different parts of New Guinea, not in different habitats. I can say this with some assurance because I collected much of the material myself, and knew fairly well what I was getting when I collected it. I know of no case either among New Guinean Agonini or among other Carabidae in which such slightly differentiated forms, which seem to me to be incipient species, are segregated primarily by habitats rather than geographically. It is true that in some cases obviously related but distinct species belonging to single genera or groups within genera do occur in different habitats in single small areas. Two such cases are described in the present paper under the genera *Nebriagonum* and *Laevagonum*, in both of which radiation of

species into different habitats seems to have occurred on or near the Bismarck Range. But in these and most other cases of the same sort, at least among Carabidae, the species are distinct ones. It is possible that they have arisen primarily as a result of ecological segregation, but it is also possible that they were first segregated geographically and that they have come together again and become adapted to different habitats only after becoming specifically distinct. The Bismarck Range is sufficiently broken up, and the mountain forest to which many of the Carabidae are confined is sufficiently divided into separate tracts, to allow initial geographical isolation of local forms.

Evidences of mutation. The role of mutation in wing-atrophy of Carabidae has long been suspected and is now pretty well proved. Mendelian inheritance of vestigial wings has been demonstrated by actual breeding of one species of carabid (see Lindroth, *Hereditas*, Vol. 32, 1946, pp. 37–40), and the mode of occurrence of wing-forms in many other dimorphic species is such as to leave little doubt that the dimorphism is mutational and Mendelian. In some cases the wings seem to have been reduced from a fully developed to a fixed vestigial form by a single mutation. In other cases the reduced wings are variable, and intergrades may occur between the fully developed and vestigial wing-forms. In these cases the reduced wings may be controlled by more than one mutation, or possibly by one mutation the effect of which is modified by physiological factors. The whole subject of carabid wing-dimorphism and atrophy, and its relation to habitat and distribution, is discussed in Lindroth's great work on "Fennoskandischen Carabidae" (Part III; *Medd. Göteborgs Mus. Zool.*, Avd. 122, 1949, pp. 335ff).

Mutation is probably involved also in loss of setae by Carabidae. I have elsewhere (*Mem. Soc. Cubana Hist. Nat.*, Vol. 11, 1937, p. 136) described a case of strict dimorphism of setae in the Cuban *Phloeoxena deälata* Darl., in which, in a series of 35 specimens from one small area (the summit forest of Pico Turquino), the anterior supraocular and the anterior-lateral pronotal setae are apparently inherited as a group, presumably in Mendelian fashion, both these pairs of setae being present or both absent in all individuals of the series. I have found no similar case of strict dimorphism of setae among New Guinean agonines, but nevertheless it seems likely that loss of setae in the latter has been by mutation. In a number of cases one or more pairs of standard setae or of elytral punctures are uniformly present in certain species of a genus and uniformly absent in other species, and in these cases a simple mutational change is suggested. In some other cases (*e.g.* that of the posterior-lateral pronotal setae of *Nebriagonum cephalum*) certain setae occur erratically or asymmetrically. These

cases recall, but do not exactly parallel, the variably reduced wings of some Carabidae. It seems likely that such irregular disappearance of standard setae is due to mutation modified by physiological factors. Mutation may reduce the seta-forming potential to near a threshold, and minor physiological factors or even chance may then determine whether or not a certain seta is formed in a given individual. In accordance with this possibility are the facts that formation of fixed setae is usually an all-or-nothing matter (a given seta is usually either fully developed or completely absent, rarely reduced or vestigial); and that in some cases a given seta is fully formed on one side and completely absent on the other in single individuals.

Dimorphism following mutation is to be expected also in form of eyes, form of fourth hind-tarsal segment, form of microsculpture (which is known to be dimorphic in some Dytiscidae), details of male copulatory organs, and other structures of taxonomic importance, but I cannot now give clear examples from Carabidae. It is very important that taxonomists should look for and record cases of such dimorphism.

TAXONOMIC SECTION

Tribe AGONINI

Anchomenini Auct., including Sloane (Trans. Ent. Soc. London for 1923, p. 248) and Jeannel (Faune de France, Coléoptères Carabiques, Part 2, 1942, p. 867; and Coléoptères Carabiques de la Région Malgache, Part 2, 1948, p. 513).

Platynini Auct., including G. Horn (Trans. American Ent. Soc. **9**, 1881, p. 141).

Agoni Csiki (Coleopterorum Catalogus, Carabidae, Harpalinae **5**, 1931, p. 739).

This group, under the various names cited, is variously defined and limited by different authors. Its exact characters and limits need not be discussed here, however, for all the New Guinean forms referred to it are typical Agonini in a fairly narrow sense. I shall therefore proceed at once to a discussion of genera within the tribe.

The Agonini of the tropics, including those of the Oriental-Australian area, are badly in need of generic revision. Jeannel (1948, *op. cit.*, pp. 215–217) has indeed offered a classification of the "principal" Oriental genera of the tribe, but he has omitted at least nine genera which have long been known from the Oriental Region, including some which are peculiar to it; his classification is based in part on characters which are not really of generic value among Oriental Agonini — for example, on presence or absence of denticles at the sutural angles of the elytra; and the classification is marred also by outright errors. For example, his new genus *Nesiocolpodes* is defined in part by absence

of accessory setae on the fifth hind-tarsal segment, but the assigned genotype (*Colpodes saphyrinus* Chd.) has such setae plainly, though not conspicuously, developed. Also, Jeannel has misidentified the genotype of *Colpodes* (*brunneus* Macl.), and has figured under this name (*op. cit.*, 1948, p. 514, Fig. 235a) an entirely different species, belonging to a different genus according to his own key. This classification is so superficial and so confused by error as to be of little use even for Oriental Agonini, and it is no use at all for the New Guinean forms.

The following key to the genera of Agonini of New Guinea is far from perfect but it has at least the merit of being a result of real study of many species. It is, of course, a preliminary contribution to agonine classification rather than a final arrangement of even the New Guinean forms. The key is designed primarily for identification and is not intended to be phylogenetic. A more nearly phylogenetic arrangement of genera has been suggested above (Table 1) but, as I have said, agonine phylogeny has been much too complex to reduce to a simple linear arrangement.

Key to the Genera of Agonini of New Guinea

1. Mentum not toothed; (small, broad, convex, *Bembidion*- or *Perigona*-like forms) (p. 116) ..... *Arhytinus*
— Mentum toothed (except apparently in *Colpodes sinuicauda*, a large, *Platynus*-like species) 2
2. Tarsi wide, flat, with first 3 segments as well as 4th obviously asymmetrical; hind tibiae deeply sulcate along outer edges; (winged, elytra gibbous with basal margin incomplete and apices spined, etc.) (p. 120) ..... *Tarsagonum*
— Tarsi narrower, with first 3 segments not obviously asymmetrical (but 4th segment often somewhat asymmetrically lobed); hind tibiae not or at most slightly sulcate along outer edges 3
3. Prosternal process with setae; (rather large, dull black, mountain-living forms, with vestigial wings, and with pronotum usually strongly transversely rugulose) (p. 229) ..... *Idiagonum*
— Prosternal process without setae 4
4. Mesosternal epimera more broadly triangular, with outer edge about ½ length of anterior edge; 4th hind-tarsal segment with 2 long, nearly equal lobes; (small, broad, depressed, bicolored forms, with elytral apices broadly rounded) (p. 122) ..... *Euplenes*
— Mesosternal epimera narrower; 4th hind-tarsal segment emarginate or lobed, but if with long lobes, outer lobe longer than inner 5
5. Tarsal claws each with an acute tooth at base; (rather slender, winged, prothorax suboval); (not recorded from New Guinea but may occur there) (p. 124) ..... (*Dicranoncus*)

— Claws not toothed 6

6. Apices of elytra at least in part minutely subserrate or with projecting granules; (first 4 hind-tarsal segments with a nearly regular single row of bristles on each side below, but with middle of sole bare); (slightly aeneous, somewhat ălutaceous, *Agonum*-like, with 4th hind-tarsal segment emarginate, not lobed) (p. 125) ..... *Lorostemma*

— Apices of elytra not subserrate or granulate; (clothing of lower surface of hind tarsi variable, but rarely as described above) (*Agonum* and *Colpodes* in a conventionally broad sense) 7

7. Wings full; all standard setae of head and pronotum present; elytra not mottled with light and dark 8

— *Either* wings reduced; *or* one or more pairs of standard setae of head or pronotum absent; *or* (if wings full and all head and pronotal setae present) elytra mottled and ♂ last ventral segment notched at apex .. 11

8. Small (4.8–9.7 mm.), *Bembidion*-, *Agonum*-, or *Platynus*-like forms; not brightly colored (sometimes, but not usually, iridescent); (apices of elytra rounded, angulate, denticulate, or rarely spined in line with 3rd intervals); (most or all ground-living, many in lowlands, some in mountains) 9

— *Either* larger, more or less *Platynus*-like forms, *or* at least partly purple, green, or blue; (apices or elytra usually either denticulate or spined, with spines often nearly in line of sutural intervals); (mostly arboreal forms of low and middle altitudes, but some mountain species may be ground-living) 10

9. Only moderately convex (except in *gibbum*); eyes large and prominent with posterior supraocular setae not or not much behind line of their posterior margins (except in *reversior* eyes are smaller but abnormally prominent, with posterior supraocular setae well behind line of their posterior margins); (lowland and mountain forms) (p. 127) .. *Notagonum*

— More convex; eyes smaller and less prominent, with posterior supraocular setae well behind line of their posterior edges; (mountain forms) (see Couplet 12) ..... *Gastragonum* in part

10. Front not wrinkled; color (in New Guinean forms) metallic, bicolored, or black (p. 158) ..... *Colpodes*

— Front longitudinally wrinkled; color brown, elytra sometimes testaceous (p. 173) ..... *Plicagonum*

11. Elytra mottled or blotched with dark and pale; ♂ last ventral segment strongly notched at apex (p. 213) ..... *Maculagonum*

— Elytra not mottled nor blotched (but sometimes broadly margined with pale); ♂ last ventral not or only slightly emarginate 12

12. All standard supraocular and lateral pronotal setae present; (convex; eyes somewhat reduced; wings full or vestigial or dimorphic; head/prothorax .70 or less; 4th hind-tarsal segment emarginate, not lobed); (see also Couplet 9) (p. 222) ..... *Gastragonum*

— At least 1 pair of lateral pronotal setae absent (except in some examples of *Nebriagonum cephalum*, in which head/prothorax is .90 or more and 4th hind-tarsal segment is lobed) 13

13. Wings full 14
— Wings vestigial 17
14. Standard setae of head and pronotum ++, +− (note anterior pronotal setae present, posterior ones absent); body extensively punctate above and below) (p. 176) ..... *Lithagonum*
— Standard setae (+)+, −(+) (note anterior pronotal setae always absent, posterior ones usually present) 15
15. Elytra strongly iridescent; lower surface with sides of sterna extensively punctate; (standard setae (+)+, −+; see also description) (p. 181) .. *Iridagonum*
— Elytra not or only moderately iridescent; sides of sterna not or only slightly punctate 16
16. Elytral striae conspicuously interrupted; 5th hind-tarsal segment with well-developed accessory setae; (standard setae ++, −−; see also description) (p. 221) ..... *Potamagonum*
— Striae not interrupted; 5th hind-tarsal segment without obvious accessory setae; (standard setae ++, −(+)) (p. 185) ..... *Altagonum*
17. *Either* head very large (head/prothorax .90 or more) *or* 5th hind-tarsal segment with obvious accessory setae; (standard setae (+)+, (−) (−), but never ++, −+); (see also description) (p. 235) ..... *Nebriagonum*
— Head relatively narrower; 5th hind-tarsal segment without obvious regular accessory setae (but sometimes with 1 or 2 small adventitious ones) .. 18
18. Standard setae ++, −+, with posterior-lateral pronotal ones about 1/6 of prothoracic length before posterior angles (p. 233) ..... *Montagonum*
— Posterior-lateral pronotal setae absent 19
19. Standard setae ++, (−)−; small (5.5–8.4 mm.), slender (p. 243) ..... *Laevagonum*
— Standard setae −(+), −−; larger (8.8–12.4 mm.), usually stouter (p. 247) ..... *Fortagonum*

Genus ARHYTINUS Bates

Bates 1889, Ann. Soc. Ent. France (6) **9**, p. 278.
—— 1892, Ann. Mus. Civ. Genova (Genoa) **32**, p. 378.
Andrewes 1931, Jour. Federated Malay Museums **16**, p. 473.

Diagnosis. See key.

Description. None required here. For a detailed re-description of genus and genotype see Andrewes, *op. cit.*, pp. 473–4.

Genotype. A. bembidioides Bates.

Generic distribution. Sikkim, Burma, etc. to the Philippines and New Guinea.

Notes. Although this genus is very different in appearance from most Agonini, it is not so widely set apart structurally, and the male copulatory organs (Fig. 20) are typically agonine. The species of the genus are all very much alike except in size, color of legs and antennal

bases, and minor details of proportions, etc. I shall therefore describe in full only one of the New Guinean species (*medius*) and shall compare the other two with it.

Key to the Species of Arhytinus of New Guinea

1. Larger (8.0 mm.); tip of each elytron forming a small, bluntly rectangular, *explanate* angle (p. 118) ..... *major*
– Smaller (not over 7.1 mm.); tips (sutural angles) of elytra either narrowly rounded or angulate with angles not or scarcely prominent and not explanate 2
2. Size average in genus (5.7–7.1 mm.) (p. 117) ..... *medius*
– Very small (4.0 mm.); (see also description) (p. 119) ..... *granum*

Arhytinus medius n. sp.

Description. Form as usual in genus (very small and broad, with prothorax only moderately convex, elytra relatively more so); piceous-black, upper surface moderately shining, silky and slightly iridescent, lower surface and femora brownish-piceous, tibiae and tarsi paler, antennae irregularly brown; microsculpture nearly normal: heavy and isodiametric to transverse on head, strongly transverse on pronotum, finer (just visible at 54×) and strongly transverse on elytra. *Head* rather short (as usual in genus); head/prothorax .74 & .79; eyes large and prominent; 2 supraocular setae each side, the first in a conspicuous pit, the second near inner posterior edge of eye; antennae stout (as usual in genus), outer segments about 2× long as wide (slightly variable); front with a pair of widely separated, round, poorly defined impressions anteriorly, just behind clypeal suture; front not otherwise impressed; mentum tooth absent. *Prothorax* wide; width/length 1.61 & 1.62; base/apex 1.18 & 1.13; sides arcuate for much of length, nearly straight and rather strongly converging posteriorly, not or slightly sinuate before posterior angles; latter obtuse but distinct; lateral margins rather narrow, wider posteriorly, flat, each with usual 2 setae at anterior ⅓ and base; basal foveae flat (not impressed), they and area between them across base rather irregularly punctate; disc otherwise impunctate, normal; anterior marginal line entire, posterior one vague. *Elytra* moderately rounded at sides, rather strongly convex (as usual in genus); basal margin entire, rounded at humeri; lateral margins moderate; apices continuing curves of lateral margins (subapical sinuations absent) to near sutural angles; latter slightly variable, either narrowly rounded or subangulate, but without *explanate* angulations; striae entire, rather lightly (somewhat variably) impressed,

punctulate; intervals nearly flat or slightly convex, impunctate; outer intervals not much modified toward apex; 3rd interval impunctate. *Inner wings* fully developed. *Lower surface* impunctate except for a few punctures at sides of meso- and metasterna; abdomen not pubescent except on last ventral segment of ♀; prosternal process simple; mesepimera very narrow; metepisterna moderately long. *Legs* normally formed; hind tibiae vaguely sulcate along outer edges (middle tibiae more distinctly so); hind tarsi slender, with 1st segment longer than next 2 together (by measurement); 4th segment emarginate at apex, not lobed; sole of hind tarsus with bristles irregular (or in 4 rows ?) on 1st segment, in 2 regular rows with middle of sole bare on 2nd to 4th segments; 5th segment without obvious accessory setae; claws simple. *Secondary sexual characters* normal, except last ventral segment glabrous in ♂ (except for usual pair of conspicuous setae), with sparse, short, inconspicuous pubescence in ♀. *Measurements:* length 5.7–7.1; width 2.4–3.0 mm.

Types. Holotype ♂ (M.C.Z. No. 28,586) and 3 paratypes from Dobodura, **Papua**, Mar.–July 1944 (Darlington), taken among dead leaves on the ground in forest; additional paratypes from **Neth. N. G.** as follows: 1, Hollandia, July–Sept. 1944 (Darlington); 2, Sabron, Cyclops Mts., 2,000 ft., June & July 1936 (Cheesman, British Mus.).

Measured specimens. The ♂ holotype and 1 ♀ paratype from Dobodura.

Notes. This is very near the genotype (*Arhytinus bembidioides* Bates of Indo-China, etc.) and certain Philippine species (*philippinus* Jedl. and *piceus* Jedl., if these are recognizable), but it differs from all of them in color of legs, with femora dark rather than pale. (I have seen the types or authentic specimens of all the species in question.) This difference is of itself of no more than subspecific value, but I prefer to treat the New Guinean form as a species until the interrelationships of the others are better understood.

Arhytinus major n. sp.

Description. Almost the same as *medius* (preceding species) in form and color except legs and antennae almost entirely blackish; same in generic characters; but larger and differing in details noted in following abbreviated description. *Head* .73 width prothorax; about as in *medius* but antennae a little more slender, with outer segments slightly more than 2× long as wide. *Prothorax* slightly narrower (width/length 1.55) than in *medius*, less convex, with wider margins more nearly in plane of disc anteriorly but more reflexed posteriorly; base/apex 1.17; sides arcuate anteriorly, strongly converging posteriorly,

faintly sinuate before obtuse but distinct posterior angles; basal foveae wide but only slightly impressed, they and basal area between them punctate; anterior marginal line nearly entire but vague at middle, posterior one indistinct. *Elytra* of about normal outline and convexity for genus but with sides a little straighter than usual before middle; sides posteriorly almost evenly rounded to suture, but apex of each elytron near suture with a small, bluntly rectangular, slightly reflexed or explanate projection; striae rather light, punctulate; intervals nearly flat on disc, slightly more convex toward sides and still more at extreme apex. *Inner wings* fully developed. *Lower surface, legs,* and *secondary sexual characters* (of ♂) as in *medius. Male copulatory organs* as figured (Fig. 20), typically agonine. *Measurements:* length 8.0; width 3.2 mm.

Type. Holotype ♂ (M.C.Z. No. 28,587) from Dobodura, **Papua,** Mar.–July 1944 (Darlington); unique.

Measured specimen. The holotype.

Notes. This species is about the size of *Arhytinus irideus* Jedl., of which I have seen the type from Mindanao (British Mus.) and a second specimen identified by myself from Borneo (borrowed from British Mus.). As compared with *irideus,* the present new species has a relatively smaller, narrower, less convex prothorax with less well-defined lateral margins and more strongly punctate foveae; and the elytral apices have minute projections which are not present in *irideus.*

Arhytinus granum n. sp.

Description. Almost a miniature replica of *medius* in form; same in generic characters; about same in color and sculpture, except micro-sculpture especially of elytra relatively more distinct, and surface correspondingly less iridescent. *Head* .79 & .80 width prothorax; antennae even stouter than in *medius,* outer segments about 1½× long as wide. *Prothorax* slightly narrower (width/length 1.50 & 1.55), with slightly narrower base (base/apex 1.08 & 1.04) and perhaps slightly more convex pronotum, but otherwise as in *medius.* Elytra about as in *medius* but a little more deeply striate, with striae less distinctly punctulate; apices almost evenly conjointly rounded (as in some examples of *medius*). *Inner wings* fully developed. *Lower surface, legs,* and *secondary sexual characters* (♀) about as in *medius,* with last ventral segment of ♀ with similar sparse, short, inconspicuous pubescence. *Measurements:* length (both specimens) 4.0; width 1.6 mm.

Types. Holotype ♀ (M.C.Z. No. 28,588) from Dobodura, **Papua,** Mar.–July 1944 (Darlington), taken among dead leaves on the ground

in forest; and 1 ♀ paratype from Aitape, **N-E. N. G.**, Aug. 1944 (Darlington), taken in heavily flooded, forested or formerly forested country.

Measured specimens. The types.

Notes. Distinguishable from *medius* by small size and details given above. It is smaller than *minimus* Jedl. of the Philippines and differs from it also in color of legs, with femora brownish-piceous rather than yellow. *Arhytinus granum* here described is probably the smallest known species of the whole tribe Agonini.

Tarsagonum new genus

Diagnosis. Genus strongly characterized by inflated form, incomplete basal margins of elytra, all tibiae strongly sulcate along outer edges, prosternal process margined at tip, and especially by wide, flattened, asymmetrical middle and hind tarsi.

Description. Genus based on one species, so generic and specific characters not separable. See specific description.

Genotype. Tarsagonum latipes n. sp. (below).

Generic distribution. Known only from one locality in eastern New Guinea.

Tarsagonum latipes n. sp.

Description. Form as figured (Fig. 1), like very stout *Platynus* but with more convex pronotum and inflated elytra; black, appendages blackish or dark-brown; upper surface moderately shining, silky or opalescent rather than iridescent, with microsculpture fine but visible at 54×, normal. *Head* moderately elongate, .71 & .73 width prothorax; eyes moderate in size, not very prominent; anterior supraocular setae near inner corners of eyes, posterior ones distinctly behind line of posterior edges of eyes; antennae only moderately long, pubescent from near base of 4th segment (as usual); 3rd segment longer than 4th, more than 2× length of 2nd; outer segments about 4× long as wide; frontal impressions sublinear, not sharply defined, strongly oblique, more or less connecting anterior supraocular punctures with a pair of widely separated punctures at clypeal suture; front impunctate; neck constriction moderate; mentum tooth strong, triangular, channeled; ligula broad, bisetose; paraglossae slender, much longer than ligula, separated from it well before its apex; palpi rather slender; 2nd segment of labial palpi bisetose. *Prothorax* subcordate; width/length 1.29 & 1.33; base/apex 1.21 & 1.15; sides strongly rounded through much of length, strongly sinuate near base; anterior angles only

slightly advanced, blunted; posterior angles about right, sharply defined; lateral margins moderate, flat or slightly reflexed, each with usual 2 setae at about middle of length and base respectively; basal foveae poorly defined, only slightly impressed, nearly flat, closely and rather coarsely punctate, the punctation extending across base and along sides of pronotum to apex; disc of pronotum otherwise impunctate, normal; anterior marginal line more or less interrupted at middle, posterior one present at sides but obsolete at middle. *Elytra* wide, inflated; basal margin obsolete inside ends of 5th striae, broadly rounded at humeri; lateral margins narrow anteriorly, wider behind middle, then narrower to apices; subapical sinuations absent or indistinct; apices each with a spine about opposite 3rd interval (the spine about as long as width of 1½ discal intervals), then more or less emarginate to sutural angles; latter obtusely angulate, not denticulate; striae entire except some inner ones slightly abbreviated at base, finely punctulate; intervals flat or nearly so, not punctulate; 2nd interval slightly broader than others on disc; 8th narrowed toward apex, and both 8th and 9th impressed or longitudinally sulcate toward apex; ocellate puncture at base of 1st stria (as usual); anterior dorsal puncture of 3rd interval by 3rd stria at basal 1/10, middle dorsal puncture about midway between 2nd and 3rd striae just before middle of elytral length, posterior dorsal puncture absent in all specimens. *Inner wings* fully developed. *Lower surface* with sterna extensively and closely punctate, the punctation extending to sides of first 2 abdominal segments and grading into wrinkling at sides of following segments; abdomen impunctate in broad median area, not pubescent; prosternal process margined at tip but without setae; mesepimera narrow; metepisterna rather long. *Legs* normally formed; all tibiae strongly sulcate along outer edges; all tarsi broad, much flattened; segments 1 to 4 each more or less asymmetrical (Fig. 15), with 2 main sulci above and 2 less distinct ones at sides, so segments are more or less 3-costate above; segments 1 to 4 below densely bristly; 4th hind-tarsal segment with a long outer lobe but almost no inner one (Fig. 16); 5th hind-tarsal segment without obvious accessory setae; claws simple. *Secondary sexual characters* normal. *Male copulatory organs* as figured (Fig. 21). *Measurements:* length (including elytral spines) 10.6–11.6; width 4.6–4.9 mm.

Types. Holotype ♂ (M.C.Z. No. 28,589) and 12 paratypes all from Dobodura, **Papua**, Mar.–July 1944 (Darlington). All the specimens were found in masses of dead leaves on the ground in forest; most of them, in a single deep, damp bed of such leaves under the top of a fallen tree. Some other fine Carabidae (*Iridagonum*, *Pogonoglossus*, etc.) occurred in the same place, and also scorpions, one of which stung

me viciously on the finger as I was carrying down and washing out the mass of leaf-debris in the pools of a small brook.

Measured specimens. The ♂ holotype and 1 ♀ paratype.

Notes. So far as I can find, this insect is not very closely related to anything previously known. In appearance it somewhat suggests *Dirotus subiridescens* Macl. or *extensicollis* (Bates), but its technical characters, including those of the tarsi, are very different (*e.g.* in *Dirotus* the elytra are fully margined at base and the tarsi are slender).

Genus EUPLENES S.-G.

Schmidt-Goebel 1846, Faun. Coleop. Birmaniae, p. 52.
Csiki 1931, Coleop. Cat., Carabidae, Harpalinae **5**, p. 767 (see for additional references).

Diagnosis. See key to genera, above.

Description. None required here.

Genotype. E. cyanipennis S.-G.

Generic distribution. Oriental Region to Japan, Philippines, New Guinea, Solomons; and Africa and Madagascar.

Notes. The Oriental species of this genus are very uniform in structure but differ among themselves strikingly in color and slightly in proportions, sculpture, etc.

Key to the Species of Euplenes of New Guinea

1. Elytra blue or greenish-blue, each with a conspicuous yellow blotch before middle, but with apices not rufescent (p. 122) . . . . . *laetus*
– Elytra blue, without discal blotches, but with apices rufescent (p. 123) . . . *apicalis*

EUPLENES LAETUS n. sp.

Description. Form as usual in genus, broad, rather flat, *Lebia*-like; head, prothorax, lower surface, and appendages rufous; elytra blue or greenish-blue, slightly reddish in scutellar and anterior sutural area, and each with a conspicuous, elongate-oval, yellow blotch before middle centering on 5th interval but invading 4th and 6th ones; moderately shining; microsculpture faint on head but apparently isodiametric, a little more distinct and slightly transverse on pronotum, still more distinct and more transverse on elytra; head, pronotum, and elytral intervals with also very fine, sparse, inconspicuous punctulation. *Head* formed as usual in genus, .74 & .71 width prothorax. *Prothorax* broad; width/length 1.56 & 1.59; base/apex about 1.4, but anterior angles too broadly rounded for accurate measurement of apex; sides

broadly rounded for much of length, then sinuate just before base; basal angles obtuse but nearly right, slightly blunted; basal foveae broad and shallow (as usual), they, basal area between them, and sides of pronotum moderately punctate. *Elytra* normal in genus, broad, with slight subapical sinuations of lateral margins before broadly rounded apices; striae moderately impressed, more or less distinctly punctulate; intervals slightly convex on disc, more so laterally; 5th interval broadly impressed at yellow blotch, the impression associated with some distortion of striae 3 to 6; 3rd interval with usual 3 discal punctures, anterior and middle ones by 3rd stria, posterior one nearer 2nd stria. *Inner wings* fully developed. *Lower surface, legs,* etc. normal for genus. *Measurements:* length 7.6–7.7; width 3.3–3.4 mm.

Types. Holotype ♂ (Leiden Mus.) from mountain slope above Bernhard Camp, Snow Mts., **Neth. N. G.**, 100 m. (about 325 ft.) altitude, Apr. 1939; and paratypes (M.C.Z. No. 28,590, and Buitenzorg Mus.) from the same general area (Snow Mts.) as follows: 1, Idenburg River, 400 m. (about 1,300 ft.), July 15–Nov. 15, 1938; and 3, Baliem Camp, 1,600 & 1,700 m. (about 5,200 & 5,525 ft.), Nov. & Dec. 1938 (all Toxopeus).

Other material. One specimen, not a type, from Malaita, **Solomon Islands** (American Mus.).

Measured specimens. The ♂ holotype and 1 ♀ paratype from Baliem Camp.

Notes. This is very close to *Euplenes guttatus* Andr., which occurs from the Malay Peninsula to Celebes, but the elytra are primarily green in *guttatus*, blue in *laetus*. The latter may prove to be no more than a geographical subspecies of the former, but I do not like to use trinomials until the real relationships of the various forms are better understood than they yet are in this genus.

Euplenes apicalis n. sp.

Description. Form as usual in genus; head, prothorax, lower surface, and appendages red; elytra dark blue with apices red; surface moderately shining; microsculpture indistinct on head, faint and transverse on pronotum, more distinct (but still light) and more transverse on elytra; sparse punctulation of upper surface even finer than in *laetus*, scarcely visible at 54×. *Head* formed as usual in genus, .74 & .73 width prothorax. *Prothorax* broad; width/length 1.47 & 1.52; base/apex about 1.25 (apex cannot be measured accurately, for anterior angles indeterminate); sides moderately rounded (a little less so than in *laetus*), not or slightly sinuate before base, except basal angles minutely prominent; basal foveae broad and shallow, they and area

between them and sides of pronotum before them moderately, irregularly punctate. *Elytra* normal in genus; striae moderately impressed, distinctly punctulate; intervals nearly flat or slightly convex on disc, more convex laterally; 5th interval with a strong longitudinal impression before middle accompanied by some distortion of striae 3 to 6; 3rd interval 3-punctate as in *laetus*. *Inner wings* fully developed. *Lower surface, legs,* etc. normal for genus. *Male copulatory organs* as figured (Fig. 22). *Measurements:* length 6.9–7.7; width 3.0–3.4 mm.

Types. Holotype ♂ (M.C.Z. No. 28,591) and 8 paratypes from Dobodura, **Papua**, Mar.–July 1944 (Darlington), in piles of dead leaves on the ground and clumps of dead leaves on fallen trees, in forest. Also additional paratypes as follows: **Papua**, 1, Milne Bay, Dec. 1943 (Darlington); 1, Fly River 5 miles below Palmer River, May 23–31, 1936 (Archbold Exp., American Mus.). **Neth. N. G.:** 1, Sabron, Cyclops Mts., 2,000 ft., July 1936 (Cheesman); 1, Cyclops Mts., 900 m. (about 2,925 ft.), end of June 1938 (Toxopeus); 2, Rattan Camp, Snow Mts., 1,200 m. (about 3,900 ft.), Feb.–Mar. 1939 (Toxopeus); and 1, Araucaria Camp, Snow Mts., 800 m. (about 2,600 ft.), Mar. 1939 (Toxopeus).

Other material. One badly damaged immature specimen from **Waigeo Island** (Cheesman); and 2 ♀ ♀ from Cape Gloucester, **New Britain** (Darlington).

Measured specimens. The ♂ holotype and 1 ♀ paratype from Dobodura.

Notes. The coloration of this species is unique in the genus, so far as I know.

(Genus DICRANONCUS Chd.)

Chaudoir 1850, Bull. Soc. Nat. Moscow **23**, 2, p. 392.
Csiki 1931, Coleop. Cat., Carabidae, Harpalinae **5**, p. 742 (see for additional references).

Diagnosis. See key.
Description. None needed here.
Genotype. D. femoralis Chd.
Generic distribution. Oriental Region to Japan, the Philippines, the Solomons, and northeastern Australia; but not yet found in New Guinea.

(DICRANONCUS QUEENSLANDICUS (Sloane))

Platynus queenslandicus Sloane 1903, Proc. Linn. Soc. New South Wales **28**, pp. 632 (in key) & 633.
Dicranoncus queenslandicus Sloane 1920, *op. cit.* **45**, p. 322.

Description. The following description is for superficial recognition only. Rather slender, dark brown, about 7 mm. long; *head* rather small; *prothorax* suboval; *elytra* with sutural angles denticulate; all standard supraocular and lateral pronotal setae present; wings full; and tarsal claws of course toothed. *Male copulatory organs* illustrated in Fig. 23.

Type. From Mackay, Queensland, Australia; should now be in the Sloane Collection at Canberra, Australia.

Occurrence in New Guinea. Not yet recorded.

Notes. Although I have not seen this species from New Guinea, it probably occurs there or, if not, its absence is noteworthy, for it is now known from northeastern **Australia**, Guadalcanar Is. in the **Solomons** (J. A. Husche, Bishop Mus.), Cape Gloucester in western **New Britain** (Darlington), **Celebes** (received from C. J. Louwerens), **Sumbawa** (British Mus.), **Java** (received from Louwerens), the **Philippines**, and southern **India** and **Ceylon**. In Luzon I found it in clumps of tall grass in open country, not in shaded masses of vines and shrubbery frequented by *D. quadridens*. It should be looked for in the *kunai* grass in New Guinea.

Genus LOROSTEMMA Mots.

Motschulsky 1864, Bull. Soc. Nat. Moscow **37**, 4, p. 329 (*Lorostema*).
Csiki 1931, Coleop. Cat., Carabidae, Carabinae **5**, p. 875 (see for additional references).

Diagnosis. See key.

Description. I am not ready fully to describe or even to characterize this genus now. It includes some species which are rather striking in appearance, with long antennae, as well as some which are very *Agonum*-like, like the present one. They are all dull, often alutaceous, with elytral apices often (but perhaps not always) very finely more or less subserrate or granulate, and 4th hind-tarsal segment simply emarginate. I suspect, but have not yet confirmed my suspicions, that certain eastern Asiatic and Australian species now listed (in *Coleopterorum Catalogus*) under *Agonum* or *Anchomenus* will go into *Lorostemma* when the latter is properly defined.

Genotype. L. alutaceum Mots.

Generic distribution. The main part of the Oriental Region to Japan, the Philippines, and New Guinea and New Britain.

Notes. See discussion under description, above.

LOROSTEMMA INFORMALIS n. sp.

Description. *Agonum*- or *Notagonum*-like; dark-brown to piceous-black with faint aeneous lustre, lower surface and appendages slightly paler, outer margins of prothorax and elytra more or less paler and translucent; surface moderately shining, less alutaceous than usual in genus; microsculpture normal. *Head* .78 & .77; eyes large, prominent; both pairs supraocular setae present, posterior ones slightly before line of posterior edges of eyes; antennae not elongate (in genus), with 4th segment about 4× long as wide, scarcely longer than 3rd; neck only slightly, indefinitely impressed above; front normal. *Prothorax* subcordate; width/length 1.48 & 1.49; base/apex 1.16 & 1.22; sides moderately rounded, sometimes faintly angulate at anterior setae, moderately or scarcely sinuate before base; anterior angles not advanced beyond line of (broadly emarginate) anterior edge of pronotum; posterior angles obtuse but distinct and usually well formed; lateral margins moderately broad, moderately reflexed, each with a seta about $\frac{2}{5}$ from apex and at base; basal foveae simple, rather poorly defined, moderately deep, strongly microreticulate, vaguely punctate; anterior marginal line entire, deep; posterior one obsolete; disc normal, impunctate except vaguely punctate at sides near foveae. *Elytra* of about outline and convexity of normal *Agonum s. s.* but with disc often faintly and irregularly impressed; basal margins entire, rounded or faintly subangulate at humeri; lateral margins moderate, rounded or vaguely subangulate before subapical sinuations; latter rather strong; apices independently more or less rounded, without or with only a suggestion of teeth at sutural angles; apical margin at least in part irregularly, finely subserrate or with projecting granules (these marginal details sometimes faint); striae rather deep, impunctate; intervals moderately convex, 8th a little narrowed and very convex toward apex, 9th wide and only slightly convex toward apex; 3rd interval normally 3-punctate, the punctures well impressed. *Inner wings* full. *Lower surface* impunctate or nearly so; abdomen not pubescent; prosternal process normal; mesepimera narrow; metepisterna moderately long. *Legs:* hind tibiae not or vaguely sulcate along outer edges (but middle tibiae are thus sulcate); hind tarsi with 4th segment simply emarginate, 5th segment without obvious accessory setae, sole with a nearly regular single row of strong setae each side of segments 1 to 4 but with middle of sole bare; claws simple. *Secondary sexual characters* normal. *Male copulatory organs* as figured (Fig. 24), with apex of middle lobe beyond orifice slightly compressed in vertical plane. *Measurements:* length 6.0–7.9; width 2.5–3.2 mm.

Types. Holotype ♂ (M.C.Z. No. 28,592) and 17 paratypes from Dobodura, **Papua**, Mar.–July 1944 (Darlington); and additional para-

types as follows: **Papua:** 26, Oro Bay (near Dobodura), Dec. 1943 (Darlington); 4, Lake Daviumbu, Fly River, Aug. 19–30, 1936 (Archbold Exp., American Mus.). **N-E. N. G.:** 1, Aitape, Aug. 1944 (Darlington). **Neth. N. G.:** 14, Hollandia, July–Sept. 1944 (Darlington); 4, Maffin Bay, Aug. 1944 (Darlington); 19, Sansapor (Vogelkop), Aug. 1944 (Darlington). My specimens taken in wet places, especially in swamps.

Other material. One specimen from Cape Gloucester, **New Britain**, Jan.–Feb. 1944 (Darlington).

Measured specimens. The ♂ holotype and 1 ♀ paratype from Dobodura.

Notes. This is very much like *Lorostemma subnitens* Andr. of Sumatra, etc., but usually lacks the blunt denticles ("recurrent angles") at sutural angles of the elytra which are present in *subnitens* (I have a cotype of the latter before me); actually the denticles are more or less developed in a few specimens of *informalis*, though not in most. The New Guinean form may prove to be only a subspecies of *subnitens*, but I prefer to treat it as a species pending a better understanding of the interrelationships of the few known forms of the genus.

NOTAGONUM new genus

Diagnosis. Small or medium-sized (4.8 to 9.7 mm.), *Bembidion*- or *Agonum*- or *Platynus*-like forms; never brightly colored, rarely strongly iridescent; with fully developed wings and all usual supraocular and lateral pronotal setae and dorsal punctures of 3rd elytral intervals; and in general without unusual or striking characters; hind tarsi slender with 4th segment variable, 5th segment without obvious accessory setae. See also key to genera, above.

Description. Form as described above; color black, piceous, or reddish, with lateral margins of prothorax and elytra sometimes translucent or pale, and appendages in some cases dark, in others pale; surface often slightly but rarely strongly iridescent, moderately shining usually almost impunctate above except in some cases punctate in or in and between basal foveae of pronotum; microsculpture usually light, normal in many species, not so in others, as described. *Head* only moderately elongate in tribe; mandibles about normal in length and arcuation; eyes usually at least moderately large and prominent, with both pairs of supraocular setae present, the posterior ones usually between or very little behind level of posterior edges of eyes (but in *reversior* eyes are small but abruptly prominent, with posterior supraocular setae well behind level of their posterior edges, and eyes are reduced in an aberrant specimen of *sinuum* too); antennae moderately

slender, normal in form, pubescent from near base of 4th segment (as usual); neck not or only slightly impressed above; front usually normal, with slight anterior impressions; mentum tooth triangular, somewhat variable, usually more or less blunted and sometimes even faintly emarginate at tip. *Prothorax* variable in form and proportions; anterior angles not or moderately advanced, posterior ones usually distinct, but variable; lateral margins variable in width, but always with usual 2 setae; basal foveae simple (as usual in tribe), reaching margins, usually moderately impressed, sometimes less impressed or flat; disc of pronotum normal; anterior and posterior marginal lines variable, as described in species. *Elytra* more or less normally *Agonum*-like in outline, varying somewhat in convexity, often impressed on disc; basal margin entire, rounded or very obtusely angulate at humeri (this character somewhat variable in single species), more distinctly angulate at humeri in *reversum* and *reversior*; lateral margins moderate or narrow; outer subapical angle usually rounded, but distinct in *externum*; subapical sinuations of margin strong, moderate, weak, or rarely absent; apices variable, rounded, denticulate, angulate, or rarely spined (if spined, spines about opposite ends of 3rd intervals); striae entire (as usual), variably impressed, usually not or not distinctly punctulate, but sometimes distinctly so; intervals varying in convexity in different species; 8th & 9th somewhat variable toward apex but never deeply longitudinally impressed; no 10th interval indicated; 3rd interval always normally 3-punctate. *Inner wings* always fully developed; metepisterna moderately long. *Lower surface* usually impunctate or nearly so, usually not pubescent, but with slight or extensive pubescence on abdomen in a few species; prosternal process normal, not margined, without setae; mesepimera narrow. *Legs* normally formed; hind tibiae not sulcate along outer edges; hind tarsi slender, more or less sulcate on both sides above at least basally (the sulci vary somewhat in different species but are difficult to see and interpret); 4th hind-tarsal segment variable, simply emarginate or with short, medium, or long lobes, with outer lobe longer than inner; 5th hind-tarsal segment without obvious accessory setae but sometimes (perhaps always) with minute rudiments or vestiges of them; claws simple; sole of hind tarsus usually clothed with rather sparse, scattered bristles, with middle of sole not or only narrowly bare (but in *subrufum* the bristles form a nearly regular row on each side, and middle of sole is more broadly bare). *Secondary sexual characters* normal, except in *altum* ♀ has usually only 1 (not 2) seta each side last ventral segment. *Male copulatory organs* as figured for certain species (Figs. 25–33), fairly constant in general structure but varying in some details, especially form of apex of middle lobe and armament of internal sac.

Genotype. *Notagonum externum* n. sp. (below).

Generic distribution. Numerous in New Guinea; some species elsewhere in the Indo-Australian Archipelago; further distribution not determined.

Notes. Many of the species of this genus, including the genotype, are superficially similar to some northern *Agonum*, but differ by absence of obvious accessory setae on the 5th tarsal segments and by absence of certain other setae of the legs. Most (but not all) of the species would be included in *Colpodes* in a conventionally broad sense because the 4th hind-tarsal segment is more or less lobed, but, as I have said, this character varies from species to species and is not worth the stress it has received in the past. It must be admitted that it is hard to draw a line between *Colpodes* in my partly restricted sense and some of the forms which I am including in *Notagonum*, but I am convinced that when *Colpodes* is broken up the various species of *Notagonum* will properly form at least one and perhaps more separate genera.

All the species of *Notagonum* that I have collected are ground-living, not arboreal, and none is found in very dry open places. With these limitations, they occur in a variety of habitats. Several, especially the more slender, large-headed forms (*angustellum*, etc.), live by running water, but each shows a definite preference for a particular type of stream, large or small, shaded or unshaded, etc. A number of species, including those that most resemble typical *Agonum*, inhabit various other wet places. *N. paludum* occurs with certain Oodiini among very wet dead leaves at the edges of pools in forest. And *N. spinulum* I found only among dead leaves on the ground in heavy rainforest, with the very similar and perhaps actually related *Altagonum vallicola*. Most of the species of *Notagonum* inhabit lowlands or foothill areas, but a few of the lowland forms occur also in the mountains, and a few species are apparently confined to rather high altitudes.

The following three species, described from New Guinea many years ago by Maindron, are probably referable to *Notagonum*, but the descriptions are inadequate for even tentative identification.

Previously described species probably referable to Notagonum, but not identifiable from description

Colpodes albertisi Maindron

Maindron 1906, Bull. Soc. Ent. France, p. 24.
—— 1908, *Op. cit.*, p. 186.

Types. From the Fly River; probably in the Paris Museum.

Colpodes laglaizei Maindron

Maindron 1908, Nova Guinea **5**, p. 297.

Type. From Timena (probably the Timena River, south of Lake Sentani, Neth. N. G.); probably in the Paris Museum.

Colpodes novae-guineae Maindron

Maindron 1908, Nova Guinea **5**, p. 296.

Type. From Jamur Superieur (probably region of Lake Jamur, Neth. N. G.); probably in the Paris Museum.

These species are not included in the following key.

Key to the Species of Notagonum of New Guinea

1. Head relatively wide, .85 to .95 width prothorax; (in border-line cases refer here specimens with ventral pubescence, or with sides of prothorax sinuate ¼ or more of length before base) 2
— Head relatively narrower, .63 to .84 width prothorax; (if ventral pubescence present, head obviously less than .84 width prothorax; sides of prothorax never sinuate so far forward) 6
2. Sides of prothorax sinuate relatively near base; at least part of ventral surface of abdomen pubescent 3
— Sides of prothorax sinuate ¼ or ⅓ of length before base; abdomen not pubescent, except for fixed setae 5
3. Much of abdomen including most of last segment pubescent; (small, slender, depressed, with very long antennae) (p. 133) ..... *angustellum*
— Abdomen much less extensively pubescent 4
4. Depressed; black, legs blackish; lateral margins of prothorax narrower, not distinctly translucent (p. 134) ..... *subnigrum*
— Less depressed; brownish-piceous, legs yellow or brown, rarely blackish; lateral margins of prothorax wider (but still rather narrow), more or less translucent (p. 135) ..... *vile*
5. Eyes normal, with posterior supraocular setae about between their posterior margins; prothorax wider than long, not punctate across base (p. 136) ..... *reversum*
— Eyes smaller but abruptly prominent, with posterior supraocular setae well behind line of their posterior margins; prothorax as long as wide (by measurement), extensively punctate across base (p. 137) ..... *reversior*
6. Apices of elytra at least in part very finely subserrate or granulate, though sometimes only faintly so (piceous, *Agonum*-like, with 4th hind-tarsal segment simply emarginate) (inserted here because of similarity to some *Notagonum*) (p. 126) ..... (*Lorostemma informalis*)
— Apices of elytra not subserrate or granulate (form, appearance, and form of 4th hind-tarsal segment variable) 7

7. Lateral margin of elytron with an abrupt, sharply defined angle before the subapical sinuation (p. 138) ..... *externum*
— Lateral margin of elytron not abruptly angulate before the subapical sinuation 8
8. Apex of each elytron more or less rounded, not distinctly denticulate, not abruptly angulate, not spined 9
— Apex of each elytron denticulate at suture, and/or abruptly angulate or spined about opposite 3rd interval 14
9. Abdomen extensively pubescent; 9th (submarginal) interval of elytron near apex rather narrow and strongly convex 10
— Abdomen not pubescent, except for fixed setae; 9th interval of elytron near apex wider and nearly flat 11
10. Sides of prothorax strongly sinuate, with posterior angles right or nearly so; basal foveae of pronotum shallow, almost flat, much roughened (p. 139) ..... *sinuum*
— Sides of prothorax only moderately sinuate, with posterior angles a little obtuse; basal foveae of pronotum rather deep, less roughened (p. 140) *vaporum*
11. Small (4.8–6.5 mm.) lowland species; 4th hind-tarsal segment simply emarginate ..... *aitape*
(11a) Elytron with pale margin confined to lateral gutter; average size smaller (4.8–5.6 mm.) (p. 141) ..... (*aitape* s. s.)
(11b) Elytron with pale margin including several outer intervals; average size larger (5.5–6.5 mm.) (p. 142) ..... (subsp. *sansapor*)
— Larger (7.1–8.6 mm.) mountain species; 4th hind-tarsal segment lobed .. 12
12. Form very convex, the pronotum gibbous and with exceptionally narrow margins; (elytra lightly striate, inner striae often almost obliterated anteriorly) (p. 142) ..... *gibbum*
— Form less convex, the pronotum only normally convex and with margins only normally narrow 13
13. Elytra more than usually narrowed toward base, deeply striate; microsculpture of elytra coarser, the meshes distinct at 54X ..... *altum*
(13a) Base of prothorax relatively wider (base/apex 1.15 to 1.22) (p. 144) (*altum* s. s.)
(13b) Base of prothorax relatively narrower (base/apex 1.03 to 1.13) (p. 145) ..... (subsp. *ibele*)
— Elytra not unusually narrowed basally, lightly striate; microsculpture of elytra very fine, the meshes not visible at 54X (p. 143) ..... *sigi*
14. Apex of each elytron with a denticle at sutural angle but with no other denticle, no well-defined angulation, no spine 15
— Apex of elytron with a second denticle, or with a well-defined angulation or spine about opposite end of 3rd interval 18
15. Subapical sinuation of elytral margin rather weak; (elytral striae usually distinctly punctulate) (see also Couplet 20) (p. 145) ..... *margaritum*
— Subapical sinuation of elytral margin strong; (elytral striae not distinctly punctulate 16
16. Basal foveae of pronotum irregularly punctate; 4th hind-tarsal segment simply emarginate ..... *subpunctum*

(16a) Smaller (6.5–7.4 mm.); elytral microsculpture coarser, the meshes very distinct at 54X (p. 146) ..... (*subpunctum s. s.*)

(16b) Larger (7.7–8.5 mm.); elytral microsculpture finer, the meshes barely visible at 54X (p. 147) ..... (subsp. *capitis*)

— Basal foveae of pronotum not or indistinctly punctate; 4th hind-tarsal segment lobed 17

17. Elytra not distinctly impressed before middle, their outer margins contrastingly pale ..... *dentellum*

(17a) Smaller (7.3–8.5 mm.); eyes relatively larger and more prominent; etc. (see description) (p. 147) ..... (*dentellum* s. s.)

(17b) Larger (8.4–9.7 mm.); eyes relatively smaller and less prominent; etc. (see description) (p. 149) ..... (subsp. *chimbu*)

— Elytra broadly impressed across disc ⅓ or ⅔ from base, their outer margins not contrastingly pale (p. 149) ..... *subimpressum*

18. Apex of each elytron bi-denticulate or bi-angulate, the outer denticle or angle (about opposite end of 3rd interval) only about as prominent as the inner (sutural) one 19

— Apex of each elytron strongly angulate or spined about opposite 3rd interval, the angulation or spine much more prominent than the sutural denticle, if any 22

19. Small (5.6–6.6 mm.); elytra not distinctly iridescent ..... *paludum*

(19a) Microsculpture of elytra coarser, the meshes very distinct at 54X (p. 150) ..... (*paludum s. s.*)

(19b) Microsculpture of elytra finer, the meshes barely or not visible at 54X (p. 151) ..... (subsp. *velum*)

— Larger (7.0–9.0 mm.); elytra more or less iridescent 20

20. Legs yellowish; elytral striae usually punctulate; (see Couplet 15) ..... *margaritum* in part

— Legs dark; elytral striae not distinctly punctulate 21

21. Slightly broader, with prothorax wider (slightly more than ½ wider than long) and head relatively narrower (.68 width prothorax), but with very prominent eyes; front of prothorax only normally emarginate (p. 151) *malkini*

— Slightly less broad, with prothorax narrower (slightly less than ½ wider than long) and head relatively wider (.71 to .74 width prothorax), though with less prominent eyes; front of prothorax more deeply emarginate (with anterior angles more advanced) than usual (p. 152) ..... *iridior*

22. Elytra strongly angulate at apex opposite ends of 3rd intervals, but not spined 23

— Elytra spined at apex about opposite ends of 3rd intervals 25

23. Broad, relatively small-headed (head/prothorax .66 & .69); lateral margins of prothorax scarcely translucent (p. 153) ..... *addendum*

— More slender, relatively larger-headed (head/prothorax .77 to .80); lateral margins of prothorax contrastingly translucent 24

24. Prothorax narrower (width/length 1.30 in specimens measured) and with narrower base (base/apex 1.18 & 1.23 in specimens measured); elytra strongly iridescent (p. 154) ..... *angulum*

— Prothorax wider (width/length 1.41 & 1.42) and with wider base (base/apex 1.33 & 1.36); elytra only faintly iridescent (p. 155) ..... *subangulum*
25. Broad, black, lowland species 26
— Slender, rufescent, mountain species (p. 156) ..... *subrufum*
26. Larger (7.3–8.4 mm.); elytral striae lightly impressed; 4th hind-tarsal segment with very short lobes (p. 157) ..... *spinulum*
— Smaller (6.8 mm.); elytral striae deeply impressed; 4th hind-tarsal segment without distinct lobes; (see also description) (p. 158) ..... *subspinulum*

Notagonum angustellum n. sp.

Description. With characters of genus as described above. Form of large, slender, flattened *Bembidion*; brownish-piceous above, scarcely paler below, appendages testaceous or brownish-testaceous, outer margins of prothorax and elytra only slightly translucent; surface moderately shining, not or faintly iridescent; microsculpture normal, light. *Head* .89 & .86 width prothorax; eyes large, prominent, with posterior supraocular setae just behind line of their posterior edges. *Prothorax* subcordate; width/length 1.34 & 1.40; base/apex 1.12 & 1.16; sides less arcuate than usual, sometimes faintly angulate at anterior marginal setae, rather broadly sinuate before basal angles; latter approximately right, well defined; lateral margins rather narrow; basal foveae flat, very shallow (but sometimes a little impressed), with surface somewhat irregular but not distinctly punctate; anterior marginal line faint or interrupted at middle, posterior one vague. *Elytra* rather narrow, subparallel, depressed; subapical sinuations moderate; apices more or less independently rounded, often vaguely angulate at suture, and rarely subdenticulate there; striae moderately deep, impunctate or faintly punctulate; intervals slightly convex, 8th narrowed and strongly convex apically, 9th wide apically, partly or completely interrupted by ocellate punctures, but remaining portions convex. *Lower surface* with at most a few vague punctures, except that abdomen, including nearly the whole of its last segment, has extensive pubescence rising from fine punctures. *Legs:* 4th hind-tarsal segment lobed, outer lobe longer than inner. *Male copulatory organs:* Fig. 25. *Measurements:* length 5.8–7.4; width 2.0–2.7 mm.

Types. Holotype ♂ (M.C.Z. No. 28,593), and 16 paratypes from Dobodura, **Papua**, Mar.–July 1944 (Darlington). Additional paratypes as follows: **Papua:** 7, Milne Bay, Dec. 1943 (Darlington), and 1, same locality, Oct. 20, 1943 (W. B. Jones, Alabama Mus. Nat. Hist.). **N-E. N. G.:** 14, Nadzab, July 1944 (Darlington); 16, Chimbu Valley, Bismarck Range, 5,000–7,000 ft., Oct. 1944 (Darlington). **Neth. N. G.:** 33, vicinity of Hollandia (actually S. foothills of Cyclops

Mts.), July–Sept. 1944 (Darlington); 1, Mt. Lina, Cyclops Mts., 3,500 ft., Mar. 1936 (Cheesman); 1, Mt. Cyclops, 3,500 ft., Mar. 1936 (Cheesman); 4, Sigi Camp, Snow Mts., 1,500 m. (about 4,875 ft.), Feb. 1939 (Toxopeus); 1, Rattan Camp, Snow Mts., 1,150 m. (about 3,750 ft.), Feb.–Mar. 1939 (Toxopeus).

Other material. Six specimens from Sigi Camp, Snow Mts., 1,500 m. (about 4,875 ft.), Feb. 1939 (Toxopeus); and 2, Araucaria Camp, Snow Mts., 800 m. (about 2,600 ft.), Mar. 1939 (Toxopeus). These specimens have the ventral pubescence of *angustellum* but approach *subnigrum* (below) in color and (especially the Araucaria Camp specimens) in appearance. I should consider them a subspecies of *angustellum* except that more typical specimens of the latter occur in the Snow Mts., including Sigi Camp, too.

Measured specimens. The ♂ holotype and 1 ♀ paratype from Dobodura.

Notes. This species is easily recognized by its small size, slender and depressed form, long antennae, and extensively pubescent abdomen. The last character is repeated in *Notagonum sinuum* and *vaporum* which, however, are differently shaped, much wider species, with relatively narrower heads. Specimens of *angustellum* from different localities vary a little in size and appearance, but I cannot define recognizable subspecies. My specimens were all taken among stones by rapid streams. At Dobodura, *angustellum* occurred only beside small streams in forest. Along larger, opener streams it was replaced by *Notagonum subnigrum* and *Lithagonum annulicorne*, which also live among stones or in stone-and-gravel bars.

Notagonum subnigrum n. sp.

Description. With characters of genus as described above. Form of a very large, slender, slightly flattened *Bembidion*; black or piceous above and below, legs and first 4 antennal segments blackish, outer antennal segments browner, lateral margins of prothorax and elytra not translucent; surface moderately shining, not iridescent; microsculpture normal. *Head* .90 & .88 width prothorax; eyes large, prominent, with posterior supraocular setae about between their posterior margins. *Prothorax* quadrate-subcordate; width/length 1.36 & 1.41; base/apex 1.10 & 1.15; sides less arcuate than usual, strongly sinuate about 1/6 or 1/7 of length before basal angles; latter approximately right, very well defined; lateral margins narrow; basal foveae very shallow, flat, with surface somewhat irregular but not distinctly punctate; anterior marginal line widely interrupted at middle, posterior one vague. *Elytra* rather narrow but with sides a little more arcuate

than in *angustellum*, subdepressed; lateral margins narrow; subapical sinuations moderate; apices independently more or less rounded to suture, not denticulate; striae moderately impressed, the outer ones especially more or less distinctly punctulate; intervals nearly flat or slightly convex, 8th and 9th not much modified toward apex. *Lower surface* nearly impunctate except that abdomen has a little scattered pubescence (much less than in *angustellum*) rising from fine punctures. *Legs:* 4th hind-tarsal segment lobed, outer lobe longer than inner. *Measurements:* length 7.5–8.3; width 2.8–3.1 mm.

Types. Holotype ♂ (M.C.Z. No. 28,594) and 28 paratypes from Dobodura, **Papua**, Mar.–July 1944 (Darlington); and 1 ♂ paratype from Kokoda, **Papua**, 1,200 ft., Sept. 1933 (Cheesman). My specimens were taken in cobble-stone-and-gravel bars and in other cover by fairly large streams.

Measured specimens. The ♂ holotype and 1 ♀ paratype from Dobodura.

Notes. This is sufficiently distinguished from other species in the key, above. There is no sign of intergradation between this species and *angustellum* at Dobodura, but some specimens of *angustellum* from the Snow Mts. of Netherlands New Guinea are somewhat *subnigrum*-like at least superficially, as already noted.

Notagonum vile n. sp.

Description. With characters of genus as described above. Form of a very large *Bembidion* (*Peryphus*) or small *Agonum* (*Europhilus*); brownish-piceous, legs yellowish or brownish, antennae brownish, outer margins of prothorax and elytra somewhat paler or translucent; surface moderately shining, not or faintly iridescent; microsculpture normal, light. *Head* .86 & .89 width prothorax; eyes large, prominent, with posterior supraocular setae about between their posterior edges. *Prothorax* more or less subcordate; width/length 1.35 & 1.35; base/apex 1.26 & 1.23; sides moderately arcuate, then moderately sinuate a little before posterior angles; latter right or slightly obtuse, very little blunted; lateral margins rather narrow; basal foveae somewhat variable, flat to moderately impressed, roughened but not punctate; anterior marginal line variable, light or interrupted at middle, posterior one vague. *Elytra* slightly shorter than in preceding species, of about average outline and convexity, with disc sometimes faintly impresse-before middle; lateral margins normal; subapical sinuations moderated apices independently more or less rounded to suture, rarely sub; denticulate at sutural angles; striae moderately impressed, not or

faintly punctulate; intervals flat or slightly convex, 8th and 9th not much modified toward apex. *Lower surface* nearly impunctate, but abdomen with a little scattered pubescence (much less than in *angustellum*) chiefly along median area. *Legs:* 4th hind-tarsal segment lobed, outer lobe longer than inner. *Measurements:* length 6.7–8.2; width 2.7–3.3 mm.

Types. Holotype ♂ (M.C.Z. No. 28,595) and 26 paratypes from Dobodura, **Papua**, Mar.–July 1944 (Darlington); and 4 paratypes from Oro Bay (near Dobodura), Dec. 1943–Jan. 1944 (Darlington).

Other material. **Papua:** 9, Milne Bay, Dec. 1943 (Darlington), and 1, same locality, Oct. 20, 1943 (W. B. Jones, Alabama Mus. Nat. Hist.); 3, Palmer River at Black River, June & July 1936 (Archbold Exped., American Mus.). **N-E. N. G.:** 17, Lae, Oct. 1944 (Darlington); 15, Nadzab, July 1944 (Darlington); 9, Surprise Creek, Morobe Dist., Sept. & Oct. (Stevens, M.C.Z.); 62, Chimbu Valley, Bismarck Range, 5,000–7,500 ft., Oct. 1944 (Darlington). **Neth. N. G.:** 31, vicinity of Hollandia (actually S. foothills of Cyclops Mts.), July–Sept. 1944 (Darlington); 1, Cyclops Mts., 3,500 ft., Mar. 1936 (Cheesman), and 1 Cyclops Mts. without further locality (Cheesman); 2, Bewani Mts., Humboldt Bay Dist., 400 m. (about 1,300 fet.), July 1937 (W. Stüber, British Mus.); 6, Araucaria Camp, Snow Mts., 800 m. (about 2,600 ft.), Mar. 1939 (Toxopeus); 2, Sigi Camp, Snow Mts., 1,500 m. (about 4,875 ft.), Feb. 19 & 25, 1939 (Toxopeus); 2, Sansapor (Vogelkop), Aug. 1944 (Darlington). Also **New Britain:** 28, Cape Gloucester, Jan.–Feb. 1943 (Darlington).

Measured specimens. Holotype ♂ and 1 ♀ paratype from Dobodura.

Notes. See key (above) for distinguishing characters of the species. It is very common, in my experience, in grass and other cover beside large streams in more or less open country. The species varies both individually and geographically. I cannot now define useful subspecies, but it is likely that they will be recognized in the future. In the meantime, and for this reason, I have limited the actual type series to specimens from a restricted area.

Notagonum reversum n. sp.

Description. With characters of genus as described above. Form of preceding (*vile*) but a little more slender and convex; piceous-black, lower surface, legs, and antennal bases brownish-piceous, lateral margins of prothorax and elytra not noticeably paler; surface moderately shining, not distinctly iridescent; microsculpture normal, light. *Head* .87 & .85 width prothorax; eyes moderately large and prominent, with posterior supraocular setae about between their posterior margins.

Prothorax quadrate-subcordate, wider than long; width/length 1.18 & 1.18; base/apex 1.25 & 1.23; sides moderately arcuate anteriorly, strongly sinuate ¼ or more of length before base; posterior angles more or less acute, very well defined; lateral margins narrow; basal foveae shallow, flat or vaguely linear, not punctate and not much roughened; anterior marginal line more or less interrupted at middle, posterior one usually lightly impressed. *Elytra* rather elongate and convex; marginal line distinctly but obtusely angulate at humeri; lateral margins rather narrow; subapical sinuations rather weak; apices irregularly almost conjointly rounded, slightly produced, vaguely angulate (not denticulate) near sutural angles; striae moderately impressed, more or less punctulate; intervals moderately convex, 8th and 9th not much modified toward apex. *Lower surface* not distinctly punctate; abdomen not pubescent. *Legs:* 4th hind-tarsal segment lobed, outer lobe longer than inner. *Measurements:* length 7.3–8.6; width 2.7–3.3 mm.

Types. Holotype ♂ (M.C.Z. No. 28,596) and 11 paratypes all from Chimbu Valley, Bismarck Range, **N-E. N. G.**, 5,000–7,500 ft., Oct. 1944 (Darlington), taken along streams in open country.

Measured specimens. The ♂ holotype and 1 ♀ paratype.

Notes. This species is distinguished from all others of the genus except the following (*reversior, q.v.*) by the form of the prothorax, with sides sinuate at least ¼ of the prothoracic length before the base.

Notagonum reversior n. sp.

Description. With characters of genus as described above, except eyes abnormal (see below). Form of preceding (*reversum*), rather slender and convex; brownish-piceous, slightly paler below, legs and antennae brownish-yellow, lateral margins of prothorax and elytra not distinctly paler; surface moderately shining, not iridescent; microsculpture normal but light and restricted. *Head* .93 & .95 width prothorax; eyes relatively small but abruptly prominent, with posterior supraocular setae well behind line of their posterior edges. *Prothorax* subquadrate, relatively narrow anteriorly; width/length 1.00 & .99; base/apex 1.44 & 1.35; sides slightly, more or less irregularly arcuate anteriorly, rather strongly sinuate about ⅓ of length before base; basal angles acute; lateral margins very narrow; basal foveae only moderately impressed but entire basal area strongly depressed in the type and paratype but not in the third specimen; entire base of prothorax irregularly punctate in all specimens; anterior marginal line entire or nearly so, posterior one entire. *Elytra* suboval in the type

and paratype, longer in the third specimen; broadly and irregularly impressed about ⅓ from base; marginal line moderately angulate at humeri; outer margins rather narrow; subapical sinuations absent; apices rather narrowly rounded, not denticulate in the type and paratype but strongly denticulate (at sutural angles) in the third specimen; striae moderately impressed, faintly or not punctulate; intervals slightly convex, 8th and 9th not much modified toward apex. *Lower surface* with sides of sterna more or less punctate; abdomen not pubescent. *Legs:* 4th hind-tarsal segment lobed, outer lobe longer than inner. *Male copulatory organs:* Fig. 26. *Measurements:* length 8.6; width 3.3 mm. (third specimen 9.3 by 3.4 mm.).

Types. Holotype ♂ (Leiden Mus.) and 1 ♀ paratype (M.C.Z. No. 28,597) from Moss Forest Camp, Snow Mts., **Neth. N. G.**, 2,800 m. (about 9,100 ft.), Oct. 9–Nov. 5, 1938 (Toxopeus).

Other material. A third specimen with the same data as the types, but differing from them in several rather striking details.

Measured specimens. The ♂ ♀ types.

Notes. This species is probably related to *reversum* (above), but differs from it in several characters including form of eyes, which are unique in *Notagonum.* However, more or less similar "popped" eyes occur in several other, unrelated groups of Agonini, as already noted in the introduction. The differences in form of base of prothorax and in form and apices of elytra between the types and the third specimen mentioned above are so great that I should consider the third specimen a different species, if it came from a different locality. However, since all the specimens are from one locality, I think it likely that they all represent one strikingly dimorphic species.

Notagonum externum n. sp.

Description. With characters of genus as described above. Form of *Agonum s. s.* (Fig. 2); piceous-black, lower surface only slightly paler, antennae and legs more or less dark-brown, lateral margins of prothorax and elytra more or less pale-translucent; surface moderately shining, not iridescent; microsculpture normal. *Head* .81 & .76 width prothorax (head still narrower in some specimens); eyes large, prominent, with posterior supraocular setae between their posterior edges. *Prothorax* subcordate; width/length 1.47 & 1.49; base/apex 1.30 & 1.25; sides normally arcuate, moderately or slightly sinuate before posterior angles; latter obtuse or nearly right, blunted or narrowly rounded; lateral margins moderate; basal foveae deep, not sharply defined, micro-reticulate but not punctate; anterior marginal line faint or interrupted at middle, posterior one faint. *Elytra* of normal outline

and convexity; disc vaguely, broadly impressed about 1/3 from base; external margins moderate, each ending in a right or obtuse, well defined angle at the end of the lateral gutter; apices broadly emarginate from outer angle to opposite 3rd interval, then truncate to sutural angles; latter denticulate; striae deep, impunctate; intervals moderately convex, 8th and 9th not much modified toward apex. *Lower surface* almost impunctate; abdomen usually with a very little fine pubescence near middle. *Legs:* 4th hind-tarsal segment with a moderate outer and shorter inner lobe (Fig. 18). *Male copulatory organs* as figured (Fig. 27). *Measurements:* length 6.2–7.0; width 2.4–2.8 mm.

Types. Holotype ♂ (M.C.Z. No. 28,598) and 30 paratypes from Dobodura, **Papua**, Mar.–July 1944 (Darlington).

Other material. **Papua:** 23, Milne Bay, Dec. 1943 (Darlington); 1, Port Moresby, Oct. 1944 (Darlington). **Neth. N. G.:** 6, Sansapor, on Vogelkop, Aug. 1944 (Darlington).

Measured specimens. The ♂ holotype and 1 ♀ paratype.

Notes. This species is distinguished from all other members of the genus by the well-formed outer angles of the elytra. It apparently ranges over the whole of New Guinea, but I cannot divide it into subspecies. I know that the species occurs on the ground in wet places, but since I did not distinguish it in the field, I cannot define its habitat more exactly.

Notagonum sinuum n. sp.

Description. With characters of genus as described above. Form of *Agonum* (*Platynus*); piceous, legs and basal segments of antennae brownish-piceous, outer antennal segments paler brown, lateral margin of prothorax moderately translucent, of elytra scarcely so; surface moderately shining, not distinctly iridescent; microsculpture normal but less transverse than usual on elytra. *Head* .80 & .78 width prothorax; eyes moderately large and prominent, with posterior supraocular setae about between their posterior edges (but see aberrant specimen described below). *Prothorax* subcordate; width/length 1.38 & 1.41; base/apex 1.24 & 1.14; sides rather strongly arcuate anteriorly, strongly sinuate about 1/6 of length before base; posterior angles right or slightly obtuse, well defined; lateral margins moderate; basal foveae shallow, almost flat, much roughened, almost punctate; anterior marginal line more or less interrupted at middle, basal one vague or absent. *Elytra* of average outline and convexity; lateral margins normal; subapical sinuations moderate; apices more or less conjointly rounded, not distinctly denticulate; striae rather deep, not or faintly punctulate; intervals convex, 8th moderately narrowed toward apex

9th toward apex less wide and much more convex than usual. *Lower surface* at sides more or less subrugose or subpunctate; abdomen extensively pubescent. *Legs:* 4th hind-tarsal segment strongly lobed, outer lobe longer than inner. *Measurements:* length 6.6–7.5; width 2.5–3.0 mm.

Types. Holotype ♂ (M.C.Z. No. 28,599) and 7 paratypes from Chimbu Valley, Bismarck Range, **N-E. N. G.**, 5,000–7,500 ft., Oct. 1944 (Darlington). Additional paratypes from **Neth. N. G.:** 2, Mt. Cyclops, 3,500 ft., Mar. 1936 (Cheesman); 2, Araucaria Camp, Snow Mts., 800 m. (about 2,600 ft.), Mar. 1939 (Toxopeus).

Other material. One ♀, Sigi Camp, Snow Mts., 1,500 m. (about 4,875 ft.), Feb. 19, 1939 (Toxopeus). In this specimen the eyes, though of nearly normal shape, are reduced in size, so that the posterior supraocular setae are behind the line of their posterior edges. In all other characters (form, etc., sinuation of sides of prothorax, form of 9th elytral interval, pubescence of abdomen, form of 4th hind-tarsal segment, and form of mentum tooth, which is more or less emarginate at tip in this species) this specimen appears to be *sinuum*, of which I tentatively consider it a variant.

Measured specimens. The ♂ holotype and 1 ♀ paratype from Chimbu Valley.

Notes. The extensive abdominal pubescence, plus the general form and strong sinuation of the sides of the prothorax and also the unusual convexity of the 9th elytral interval toward apex, make this an easily recognized and strongly characterized species. It is probably closely related only to the following (*vaporum*), *q.v.*

Notagonum vaporum n. sp.

Description. With characters of genus as described above. Form of *Agonum* (*Platynus*); piceous, legs and especially antennae browner, outer margins of prothorax moderately translucent, of elytra less so; surface moderately shining; microsculpture normal but less transverse than usual on elytra. *Head* .81 & .81 width prothorax; eyes moderately large and prominent, with posterior supraocular setae about between their posterior edges. *Prothorax* subcordate; width/length 1.41 & 1.42; base/apex 1.17 & 1.15; sides irregularly arcuate anteriorly, moderately sinuate near base; basal angles a little obtuse (nearly right), well defined; lateral margins rather wide, a little reflexed and elevated toward base; basal foveae deep, moderately roughened; anterior marginal line more or less interrupted at middle, posterior one vague at middle. *Elytra* of average outline and convexity; disc vaguely impressed about basal ⅓; lateral margins normal; subapical sinuations rather slight;

apices irregularly rounded, vaguely angulate (not denticulate) near suture; striae rather deep, not or faintly punctulate; intervals slightly convex, 8th moderately narrowed toward apex, 9th unusually narrow and convex toward apex. *Lower surface* nearly impunctate; abdomen extensively pubescent. *Legs:* 4th hind-tarsal segment lobed, outer lobe longer than inner. *Male copulatory organs:* Fig. 28. *Measurements* length 6.5; width 2.5 mm.

Types. Holotype ♂ (Leiden Mus.) and 1 ♀ paratype (M.C.Z. No. 28,600) from Mist Camp, Snow Mts., **Neth. N. G.**, 1,800 m. (about 5,850 ft.), Jan. 1939 (Toxopeus).

Measured specimens. The types.

Notes. The general form, relatively narrow and convex apical part of the 9th (submarginal) elytral intervals, pubescent abdomen, and other details indicate that this species is closely related to the preceding (*sinuum*), but the prothorax of the present species is much less sinuate at sides, with wider and posteriorly much more elevated lateral margins and much deeper basal foveae.

Notagonum aitape n. sp.

Description. With characters of genus as described above. Form of broad but very small *Agonum s. s.*; piceous, legs and antennae dark-brown, lateral margins of prothorax and elytra more or less conspicuously yellow; surface moderately shining, slightly iridescent especially on elytra; microsculpture nearly normal, but very fine (scarcely visible at 54×) on elytra. *Head* .70 & .71 width prothorax; eyes large and prominent, with posterior supraocular setae about between their posterior edges. *Prothorax* rather large; width/length 1.52 & 1.55; base/apex 1.26 & 1.17; sides arcuate for most of length, slightly sinuate near base; basal angles obtuse and slightly blunted; lateral margins rather wide but only slightly reflexed; basal foveae not very deep, a little roughened but not punctate; anterior marginal line vague at middle, posterior one indistinct. *Elytra* of about normal outline and convexity; lateral margins rather wide (in group); subapical sinuations rather slight; apices rather irregularly independently rounded, more or less subangulate (not denticulate) near suture striae deep, not distinctly punctate; intervals more or less convex, 8th and 9th not much modified toward apex. *Lower surface* impunctate; abdomen not pubescent. *Legs:* 4th hind-tarsal segment emarginate at apex, not lobed. *Measurements:* length 4.8–5.6; width 2.0–2.4 mm.

Types. Holotype ♂ (M.C.Z. No. 28,601) and 10 paratypes all from Aitape, **N-E. N. G.**, Aug. 1944 (Darlington), taken in floodwater in forested or recently forested country.

Other material. One, vicinity of Hollandia, **Neth. N. G.**, July–Sept. 1944 (Darlington).

Measured specimens. The ♂ holotype and 1 ♀ paratype from Aitape.

Notes. This species should be easily recognized by its small size, rather broad form, simple elytral apices, yellow lateral margins, and simply emarginate 4th hind-tarsal segment.

Notagonum aitape sansapor n. subsp.

Description. Apparently same as typical *aitape* (of which see description, above) in structure, but a little larger, and differing in color, the elytra having *broad* yellowish-brown lateral margins and the legs and antennae being paler. The pale elytral margins reach inwardly about to the 6th intervals, but are not sharply limited, grading into the piceous color of the elytral disc. Proportions: head/prothorax .71 & .70; width/length of prothorax 1.45 & 1.50; base/apex of prothorax 1.18 & 1.22. *Measurements:* length 5.5–6.5; width 2.2–2.7 mm.

Types. Holotype ♂ (M.C.Z. No. 28,602) and 21 paratypes all from Sansapor (Vogelkop), **Neth. N. G.**, Aug. 1944 (Darlington), taken in wet places on the ground in forested country.

Measured specimens. The ♂ holotype and 1 ♀ paratype.

Notes. Sufficiently compared with typical *aitape* above.

Notagonum gibbum n. sp.

Description. With characters of genus as described above. Form of a very large *Mecyclothorax* (much more convex than normal *Agonum*); piceous-black, elytra faintly brassy in some lights, appendages reddish-yellow, outer antennal segments browner, outer margins of prothorax and elytra slightly or not paler; surface shining, not or only faintly iridescent; microsculpture finer than usual, not distinct at 54×, but surface especially of elytra with silky texture. *Head* .78 & .77 width prothorax; eyes moderately large and prominent, with posterior supraocular setae about between their posterior edges. *Prothorax* transverse-rounded, much more convex than usual; width/length 1.47 & 1.52; base/apex 1.13 & 1.17; sides arcuate for most of length, not or only slightly sinuate before basal angles; latter obtuse, blunted; lateral margins usually very narrow, but somewhat variable; basal foveae rather small, shallow, not well defined, somewhat roughened or vaguely punctate; anterior and posterior marginal lines both rather vague, more or less interrupted at middle. *Elytra* of about normal outline but much more convex than usual; disc of each elytron slightly impressed

about 2/5 from base; basal margin rounded at humeri or at most vaguely subangulate (as usual in genus); lateral margins very narrow; subapical sinuations slight; apices conjointly or slightly independently rounded, not denticulate; inner discal striae very fine, usually almost obsolete anteriorly, but somewhat variable; outer striae and inner ones toward apex moderately impressed; striae vaguely punctulate; intervals flat or slightly convex, 8th and 9th not much modified toward apex. *Lower surface* impunctate; abdomen not pubescent. *Legs:* 4th hind-tarsal segment lobed, outer lobe longer than inner. *Male copulatory organs:* Fig. 29. *Measurements:* length 7.1–7.8; width 2.6–3.2 mm.

Types. Holotype ♂ (Leiden Mus.) and 12 paratypes (some in M.C.Z. No. 28,603) all from Sigi Camp, Snow Mts., **Neth. N. G.**, 1,500 m. (about 4,875 ft.), Feb. 1939 (Toxopeus).

Measured specimens. The ♂ holotype and 1 ♀ paratype.

Notes. The very convex form, narrow prothoracic and elytral margins, and fineness of elytral striae on anterior part of disc distinguish this species and give it a remarkable similarity to a very large *Mecyclothorax*. In most other ways the species is very close to the following (*sigi*), from which it may have been derived.

Notagonum sigi n. sp.

Description. With characters of genus as described above. Form of *Agonum* (*Platynus*); piceous, appendages yellowish, outer margins of prothorax slightly translucent, of elytra scarcely so; surface moderately shining, not or faintly iridescent; microsculpture normal except that of elytra too fine to see at 54×, but elytral surface slightly silky. *Head* .78 & .78 width prothorax; eyes moderately large and prominent, with posterior supraocular setae about between their posterior edges. *Prothorax* subcordate; width/length 1.39 & 1.41; base/apex 1.21 & 1.27; sides moderately arcuate, moderately sinuate a little before basal angles; latter slightly obtuse, only slightly blunted; lateral margins average; basal foveae average, not sharply defined, slightly roughened; anterior marginal line fine but entire, posterior one light or vague. *Elytra* of normal outline and convexity; lateral margins rather narrow; subapical sinuations rather slight; apices more or less independently rounded to suture, where subangulate but not distinctly denticulate; striae moderately impressed (7th sometimes finer toward base), not or vaguely punctulate; intervals only slightly convex, 8th a little narrowed toward apex, 9th widened and nearly flat toward apex (*i.e.* 8th and 9th intervals not much modified). *Lower surface* with at most a little rather vague punctation; abdomen not pubescent. *Legs:*

4th hind-tarsal segment lobed, outer lobe longer than inner. *Measurements:* length 7.7–7.9; width 2.9–3.0 mm.

Types. Holotype ♂ (Leiden Mus.) and 3 paratypes (1 ♂ in M.C.Z., No. 28,604) all from Sigi Camp, Snow Mts., **Neth. N. G.**, 1,500 m. (about 4,875 ft.), Feb. 27 & 25, 1939, or (1 ♀ only) 1,600 m. (about 5,200 ft.), Dec. 1938 (Toxopeus).

Measured specimens. The ♂ holotype and 1 ♀ paratype.

Notes. This species is superficially rather like *vaporum* of the same general region, but differs in such important characters as the form of the 9th elytral interval (wide and nearly flat toward apex instead of narrow and very convex) and the non-pubescent abdomen. I have already suggested the possibility that this comparatively normally formed species may be ancestral to the preceding very convex one (*gibbum*).

Notagonum altum n. sp.

Description. With characters of genus as described above, except ♀ with usually only 1 seta each side last ventral segment. Form of *Agonum* (*Platynus*); piceous, appendages brown, lateral margins of prothorax and elytra only slightly paler; microsculpture normal. *Head* .79 & .79 width prothorax (sometimes a little wider); eyes moderately large and prominent, with posterior supraocular setae about between their posterior edges. *Prothorax* subcordate; width/length 1.48 & 1.44; base/apex 1.16 & 1.21; sides moderately arcuate anteriorly, moderately sinuate about 1/8 of length before base; basal angles more or less obtuse, blunted; lateral margins moderate; basal foveae moderate, roughened or subpunctate; anterior marginal line entire or nearly so but often light at middle, posterior one vague at middle. *Elytra* a little more than usually narrowed toward humeri and a little more convex than usual; lateral margins rather narrow; subapical sinuations slight; apices independently rounded; striae rather deep, not or vaguely punctulate; intervals moderately convex, 8th and 9th not much modified toward apex. *Lower surface* nearly impunctate; abdomen not pubescent. *Legs:* 4th hind-tarsal segment lobed, outer lobe slightly longer than inner. *Secondary sexual characters* normal except ♀ usually with only 1 (not 2) seta each side last ventral segment (at least one ♀ is asymmetrical, with 2 setae on one side, 1 on other). *Measurements:* length 7.7–8.6; width 2.9–3.6 mm.

Types. Holotype ♂ (M.C.Z. No. 28,605) and 25 paratypes all from Chimbu Valley, Bismarck Range, **N-E. N. G.**, some (including type) from the forested zone between 7,000 & 10,000 ft., others from open country between 5,000 & 7,500 ft., but all actually taken under cover beside the Chim River, Oct. 1944 (Darlington).

Measured specimens. The ♂ holotype and 1 ♀ paratype.

Notes. The distinguishing characters of this species are sufficiently given in the key.

Notagonum altum ibele n. subsp.

Description. Similar to typical *altum* (of which see description, above) except in proportions of prothorax, which is relatively slightly narrower in *ibele*, with base especially narrower: in *ibele* the ratio base/apex of prothorax is 1.03 (♂ type), 1.09 (♀), and 1.13 (second ♂); in 6 measured specimens of typical *altum* this ratio is 1.15 to 1.22. Other proportions of *ibele* (♂♂ ♀) are head/prothorax .80, .79, .84; width/length prothorax 1.40, 1.41, 1.38. The single ♀ of *ibele* has only 1 seta each side last ventral as usual in *altum*. *Measurements:* length 8.8–9.2; width 3.1–3.4 mm. (a little larger but relatively more slender than typical *altum*).

Types. Holotype ♂ (Leiden Mus.) and 2 paratypes (♂, M.C.Z. No. 28,606; ♀, Buitenzorg Mus.) all from Iebele (Ibele) Camp, Snow Mts., **Neth. N. G.**, 2,250 m. (about 7,325 ft.), Nov.–Dec. 1938 (Toxopeus).

Measured specimens. As indicated above.

Notes. Sufficiently compared with typical *altum* above.

Notagonum margaritum n. sp.

Description. With characters of genus as described above. Form between *Agonum s. s.* and *Platynus*; piceous-black with pearly lustre, appendages brownish-yellow, lateral margins of prothorax and elytra moderately pale-translucent (elytra the less so); surface moderately shining, moderately (not strongly) iridescent especially on elytra; microsculpture apparently normal but almost too fine to see at 54×. *Head* .74 & .74 width prothorax; eyes large and prominent, with posterior supraocular setae about between their posterior edges. *Prothorax* somewhat transverse; width/length 1.42 & 1.40; base/apex 1.26 & 1.29; sides arcuate for most of length, slightly or not distinctly sinuate before base; posterior angles obtuse, blunted or narrowly rounded; lateral margins moderate; basal foveae rather deep, scarcely roughened, not punctate; anterior marginal line fine but entire and distinct at middle, posterior one less distinct. *Elytra* of about normal outline and convexity; lateral margins moderate; subapical sinuations slight or moderate; apices independently rounded (sometimes subangulate opposite 3rd intervals), each with a strong denticle at suture; striae moderately impressed, usually more or less distinctly punctulate;

ntervals a little convex, 8th and 9th not much modified toward apex. *Lower surface* impunctate or slightly or vaguely punctate at sides of sterna; abdomen not pubescent. *Legs:* 4th hind-tarsal segment briefly lobed, outer lobe slightly longer than inner. *Measurements:* length 7.0–9.0; width 2.7–3.3 mm.

Types. Holotype ♂ (M.C.Z. No. 28,607) and 10 paratypes from Nadzab, **N-E. N. G.**, July 1944 (Darlington). Also the following additional paratypes: **Papua:** 1, Mafulu, 4,000 ft., Dec. 1933 (Cheesman). **N-E. N. G.:** 1, Finschhafen, Apr. 20, 1944 (E. S. Ross, California Acad.); 13, Chimbu Valley, Bismarck Range, 5,000–7,500 ft., Oct. 1944 (Darlington). **Neth. N. G.:** 3, vicinity of Hollandia, July–Sept. 1944 (Darlington); 1, Sabron, Cyclops Mts., 930 ft., May–June 1936 (Cheesman); 12, Cyclops Mts. (including Mt. Cyclops and Mt. Lina), 3,400(or 3,500)–4,500 ft., Mar. 1939 (Cheesman); 1, Rattan Camp, Snow Mts., 1,150 m. (about 3,750 ft.), Feb.–Mar. 1939 (Toxopeus); 2, Baliem Camp, Snow Mts., 1,600 & 1,700 m. (about 5,200 & 5,525 ft.), Dec. & Nov. 16–27, 1938 (Toxopeus).

Measured specimens. The ♂ holotype and 1 ♀ paratype from Nadzab.

Notes. The comparatively weak subapical sinuations of the elytra, usually distinctly iridescent surface, and frequently (but not always) punctulate elytral striae distinguish this species from other similar ones. In doubtful cases and in the absence of comparative material the following details should aid in distinguishing this from other species with denticulate but otherwise unarmed elytral apices: 4th hind-tarsal segment lobed (not simply emarginate as in *subpunctum*); anterior transverse marginal line of pronotum entire and distinct at middle (not vague or interrupted at middle as in *dentellum*); and elytra not transversely impressed before middle (as in *subimpressum*).

Notagonum subpunctum n. sp.

Description. With characters of genus as described above. Form of *Agonum s. s.*; black or piceous, appendages dark-brown, outer margins of prothorax and elytra slightly translucent; surface moderately shining, not distinctly iridescent; microsculpture of pronotal foveae less distinct than usual, of elytra more distinct, coarse, and less transverse than usual. *Head* .69 & .67 width prothorax; eyes large and prominent, with posterior supraocular setae about between their posterior edges. *Prothorax* rather large; width/length 1.45 & 1.47; base/apex 1.24 & 1.29; sides arcuate anteriorly, nearly straight and converging posteriorly, slightly or not sinuate before base; posterior angles obtuse, blunted; lateral margins a little wider than usual and

more elevated near base; basal foveae rather deep, usually irregularly punctate, with some punctures usually also before foveae near pronotal margins; anterior marginal line entire, basal one vague. *Elytra* of about normal outline and convexity; outer margins moderately wide; subapical sinuations strong; apices independently rounded, bluntly denticulate at suture; striae deep, impunctate; intervals somewhat convex, 8th narrowed and very convex toward apex, 9th only slightly widened and moderately convex toward apex. *Lower surface* impunctate or nearly so; abdomen not pubescent. *Legs:* 4th hind-tarsal segment simple emarginate, not lobed. *Measurements:* length 6.5–7.4; width 2.4–2.7 mm.

Types. Holotype ♂ (M.C.Z. No. 28,608) and 16 paratypes all from Dobodura, **Papua**, Mar.–July 1944 (Darlington).

Measured specimens. The ♂ holotype and 1 ♀ paratype.

Notes. This species is instantly distinguishable from superficially rather similar ones (*margaritum*, *dentellum*, *subimpressum*) by the simply emarginate rather than lobed 4th hind-tarsal segment. The unusually heavy micro-reticulation of the elytral surface should aid in recognition of the typical form of this species, but not of the following subspecies.

Notagonum subpunctum capitis n. subsp.

Description. Nearly the same as typical *subpunctum* (of which see description, above) in form, proportions, and most detailed characters, including simply emarginate 4th hind-tarsal segment (Fig. 19), but larger, with elytra much more finely micro-reticulate, the meshes barely visible at 54×. Proportions of measured specimens: head/prothorax .69 & .69; width/length prothorax 1.46 & 1.43; base/apex prothorax 1.20 & 1.24. *Measurements:* length 7.7–8.5; width 2.8–3.2 mm.

Types. Holotype ♂ (M.C.Z. No. 28,609) and 10 paratypes all from Sansapor (Vogelkop), **Neth. N. G.**, Aug. 1944 (Darlington), taken in wet places in forested country.

Other material. **Neth. N. G.:** 1, Maffin Bay, Aug. 1944 (Darlington) 1, Hollandia, June 10, 1945 (from K. M. Fender, M.C.Z.).

Measured specimens. The ♂ holotype and 1 ♀ paratype.

Notes. Sufficiently compared with typical *subpunctum* above and in the key to species of *Notagonum*.

Notagonum dentellum n. sp.

Description. With characters of genus as described above. Form of rather broad *Agonum s. s.*; piceous-black, appendages yellow or brownish-yellow, lateral margins of prothorax and elytra yellow;

surface moderately shining, slightly iridescent; microsculpture normal. *Head* .74 & .73 width prothorax; eyes large and prominent, with posterior supraocular setae about between their posterior edges. *Prothorax* moderately transverse; width/length 1.43 & 1.47; base/apex 1.26 & 1.21; sides arcuate for much of length, then moderately (somewhat variably) sinuate near base; posterior angles obtuse, blunted; lateral margins rather wide; basal foveae moderately deep, slightly roughened; anterior and posterior marginal lines irregular, faint, usually incomplete. *Elytra* of about normal outline and convexity, not or very little impressed on disc; lateral margins slightly wider than usual; subapical sinuations rather strong; apices typically narrowly subtruncate (but exact form somewhat variable), usually denticulate at suture; striae moderately deep, not or slightly punctulate; intervals slightly convex, 8th and 9th not much modified toward apex. *Lower surface* impunctate; abdomen not pubescent. *Legs:* 4th hind-tarsal segment lobed, outer lobe longer than inner. *Male copulatory organs:* Fig. 30. *Measurements* (Dobodura series): length 7.3–8.5; width 2.8–3.4 mm. (some smaller specimens from other localities).

Types. Holotype ♂ (M.C.Z. No. 28,610) and 11 paratypes from Dobodura, **Papua**, Mar.–July 1944 (Darlington). Additional paratypes as follows: **N-E. N. G.:** 1, Lae, Oct. 1944 (Darlington); 5, Nadzab, July 1944 (Darlington); 12, Aitape, Aug. 1944 (Darlington). **Neth. N. G.:** 10, vicinity of Hollandia, July–Sept. 1944 (Darlington); 3, Maffin Bay, Aug. 1944 (Darlington).

Other material. **Papua:** 4, Dobodura, Mar.–July 1944 (Darlington) (more slender than typical specimens, with elytra somewhat impressed at or slightly before middle). **N-E. N. G.:** 2, Nadzab, July 1944 (Darlington) (slender, elytra slightly impressed and not denticulate); 1, Surprise Creek, Morobe Dist., Oct. 4 (Stevens, M.C.Z.) (broad, sides of prothorax strongly sinuate). **Neth. N. G.:** 1, vicinity of Hollandia, July–Sept. 1944 (Darlington) (more slender and with elytral striae more strongly punctulate than usual); 1, Mt. Cyclops, 3,500 ft., Mar. 1936 (Cheesman) (large, with margins and appendages darker than usual); 1, Araucaria Camp, Snow Mts., 800 m. (about 2,600 ft.), Mar. 1939 (Toxopeus) (rather small and with sides of prothorax more sinuate than usual); and 1, Camp 1, Mt. Nok, Waigeo Is., 2,500 ft., May 1938 (Cheesman) (rather small, with head relatively large and prothorax smaller and with sides more sinuate than usual, and with elytral apices squarely truncate). More material is needed to clarify the status of these forms. A form of this species occurs also at Cape Gloucester, **New Britain** (Darlington); and the following subspecies is, so far as known, localized on the Bismarck Range, N-E. N. G.

Measured specimens. The ♂ holotype and 1 ♀ paratype from Dobodura.

Notes. Typical specimens of this species are identifiable by characters given in the key to species of *Notagonum*. The species is, however, a variable one, as the notes given under "Other material" suggest. This is one of the species in which the elytral denticles are variable, being acute, blunt, or faint in different individuals even in the type series, and completely absent in a few aberrant individuals.

Notagonum dentellum chimbu n. subsp.

Description. Generally similar to typical *dentellum* (of which see description, above) but larger; eyes slightly less prominent; prothorax relatively smaller, with sides usually more sinuate and basal angles usually more distinct. These differences are such that, although they give the insect a somewhat different appearance, they change its proportions very little. The proportions of the measured specimens are head/prothorax .74 & .73; width/length prothorax 1.43 & 1.45; base/apex prothorax 1.23 & 1.15. The elytra of *chimbu* have slightly stronger subapical sinuations than in typical *dentellum* and are a little more coarsely striate, and the intervals are flatter toward apex. *Measurements:* length 8.4–9.7; width 3.2–3.8 mm.

Types. Holotype ♂ (M.C.Z. No. 28,611) and 17 paratypes all from Chimbu Valley, Bismarck Range, **N-E. N. G.**, 5,000–7,500 ft., Oct. 1944 (Darlington).

Measured specimens. The ♂ holotype and 1 ♀ paratype.

Notes. Sufficiently compared with typical *dentellum* above.

Notagonum subimpressum n. sp.

Description. With characters of genus as described above. Form of *Agonum s. s.*; piceous-black, appendages brownish-piceous, outer antennal segments paler brown, lateral margins of prothorax only slightly translucent, of elytra even less so; surface moderately shining, not or slightly iridescent; microsculpture normal, but light and restricted on head and prothorax. *Head* .74 & .73 width prothorax; eyes large and prominent, with posterior supraocular setae about between their posterior edges. *Prothorax* of average size; width/length 1.44 & 1.50; base/apex 1.39 & 1.36; sides arcuate for much of length, nearly straight and converging and usually slightly sinuate toward base; basal angles obtuse, blunted or narrowly rounded; lateral margins average; basal foveae rather deep, slightly roughened, sometimes vaguely punctate; anterior marginal line entire or nearly so, posterior one entire or vague at middle. *Elytra* of average outline and convexity, but rather strongly impressed across disc about ⅓ from base; lateral

margins normal; subapical sinuations rather strong; apices independently rounded or sometimes vaguely angulate about opposite 3rd interval, rather inconspicuously denticulate at suture; striae moderately impressed, not or vaguely punctulate; intervals slightly convex, 8th and 9th not much modified toward apex. *Lower surface* nearly impunctate; abdomen with a very little fine pubescence near middle of some segments. *Legs:* 4th hind-tarsal segment lobed, outer lobe longer than inner. *Measurements:* length 8.1–8.7; width 3.1–3.5 mm.

Types. Holotype ♂ (M.C.Z. No. 28,612) and 22 paratypes from Dobodura, **Papua**, Mar.–July 1944 (Darlington), taken in a variety of damp places. Additional paratypes as follows: **Papua:** 1, Oro Bay, Dec. 1943 (Darlington); 1, Kokoda, 1,200 ft., Sept. 1933 (Cheesman); 10, Milne Bay, Dec. 1943 (Darlington). **Neth. N. G.:** 18, Hollandia, July–Sept. 1944 (Darlington), and 1, same locality, Apr. 1945 (Malkin, U.S.N.M.); 1, Araucaria Camp, Snow Mts., 800 m. (about 2,600 ft.), Mar. 1939 (Toxopeus); 7, Wasian, Sept. 1939 (Wind, M.C.Z.).

Other material. Six, Cape Gloucester, **New Britain**, Jan.–Feb. 1943 (Darlington).

Measured specimens. The ♂ holotype and 1 ♀ paratype from Dobodura.

Notes. Several other species of *Notagonum* have the elytral disc more or less impressed before the middle, but no other so much as this, which has almost a sway-backed appearance. This character, together with the rather dark legs and antennal bases, makes this species easy to recognize even superficially. Other distinguishing characters of the species are given in the key to species of *Notagonum*.

Notagonum paludum n. sp.

Description. With characters of genus as described above. Form of broad *Agonum s. s.*, but small; piceous-black, appendages brownish-piceous, lateral margins of prothorax and elytra brownish-translucent; surface moderately shining, not distinctly iridescent; microsculpture nearly normal but that of pronotum very light, that of elytra more distinct. *Head* .67 & .65 width prothorax; eyes moderately large and prominent, with posterior supraocular setae a trifle behind line of their posterior edges. *Prothorax* relatively large; width/length 1.45 & 1.45; base/apex 1.29 & 1.28; sides arcuate for much of length, straight and converging and sometimes slightly sinuate before base; posterior angles obtuse, slightly blunted; lateral margins rather wide; basal foveae moderately deep, scarcely roughened; anterior marginal line entire, posterior one lighter or vague. *Elytra* of about normal outline and convexity, each somewhat impressed before middle; lateral margins

rather wide (in genus); subapical sinuations rather strong; apices each bi-angulate or bi-denticulate (the angles or denticles about opposite 3rd and sutural intervals), with apex between angles or denticles emarginate; striae moderately impressed, not or faintly punctulate; intervals only slightly convex, more so laterally and apically (as usual), 8th and 9th not much modified toward apex. *Lower surface* impunctate; abdomen not pubescent. *Legs:* 4th hind-tarsal segment scarcely more than emarginate, but with very small inconspicuous lobes, the outer longer than inner. *Measurements:* length 5.6–6.5; width 2.2–2.5 mm.

Types. Holotype ♂ (M.C.Z. No. 28,613) and 27 paratypes all from Dobodura, **Papua**, Mar.–July 1944 (Darlington), taken among wet dead leaves by pools in forest.

Measured specimens. The ♂ holotype and 1 ♀ paratype.

Notes. This distinct little species should be easily recognized by characters given in the key to species of *Notagonum*.

Notagonum paludum velum n. subsp.

Description. Generally similar to typical *paludum* (of which see description, above); differing only slightly in size (averaging slightly larger), proportions, and most other details (elytral striae slightly deeper, etc.); but easily distinguished by elytral microsculpture. In typical *paludum* the micro-reticulations on the elytra are coarser than usual and are easily seen in all specimens at 54×, but in the present new subspecies the elytral reticulations are so fine as to be barely or not visible at the same magnification. Proportions of measured specimens: head/prothorax .64 & .64; width/length prothorax 1.54 & 1.61; base/apex prothorax 1.24 & 1.26. *Measurements:* length 6.3–6.6; width about 2.5 mm.

Types. Holotype ♂ (M.C.Z. No. 28,614) and 4 paratypes (all ♀ ♀) all from Aitape, **N-E. N. G.**, Aug. 1944 (Darlington), taken in a flood in forested or formerly forested country.

Measured specimens. The ♂ holotype and 1 ♀ paratype.

Notes. Sufficiently compared with typical *paludum* above.

Notagonum malkini n. sp.

Description. With characters of genus as described above. Form of rather broad *Agonum s. s.*; piceous-black, legs and antennal bases brownish-piceous, outer segments of antennae brown, lateral margins of prothorax slightly paler or translucent, lateral margins of elytra scarcely paler; surface moderately shining, moderately iridescent; microsculpture normal, light. *Head* .68 & .68 width prothorax; eyes

large and very prominent, with posterior supraocular setae about between their posterior edges. *Prothorax* rather large and rather transverse; width/length 1.54 & 1.55; base/apex 1.35 & 1.38; sides arcuate for much of length, then straight and converging or very slightly sinuate to posterior angles; latter obtuse, slightly blunted; lateral margins wide but not sharply set off from disc; basal foveae rather wide, moderately deep, only slightly roughened; anterior marginal line entire or slightly interrupted at middle, posterior one vague. *Elytra* rather broad, of about normal outline and convexity, not distinctly impressed on disc; lateral margins slightly wider than usual; subapical sinuations rather strong; apices each minutely angulate about opposite 3rd interval (which turns somewhat toward suture), then emarginate to denticulate sutural angles; outer angle or denticle slightly more prominent than sutural denticle; striae moderately impressed, not distinctly punctulate; intervals slightly convex, 8th narrowed and much more convex toward apex, 9th somewhat widened and somewhat flattened toward apex (but these intervals still not very much more modified than usual). *Lower surface* nearly impunctate; abdomen not pubescent. *Legs:* 4th hind-tarsal segment emarginate, scarcely lobed. *Male copulatory organs:* Fig. 31. *Measurements:* length 7.6–8.2; width 3.0 or slightly more mm.

Types. Holotype ♂ (M.C.Z. No. 28,615) from vicinity of Hollandia, **Neth. N. G.**, July–Sept. 1944 (Darlington), and 1 ♀ paratype from the same locality, Apr. 1945 (Borys Malkin, U.S.N.M.).

Measured specimens. The types.

Notes. Sufficiently distinguished from other bi-denticulate species in the key to species of *Notagonum*. I have considered whether the two specimens described above can be bi-denticulate individuals of a normally uni-denticulate species, but they seem not to be. They differ from *subpunctum* not only in form of elytral apices but also in lack of distinct punctation in the pronotal foveae and in other ways; and they differ from *dentellum* not only in form of elytral apices but also in lack of conspicuous pale lateral elytral margins, in lack of distinct lobes on the 4th hind-tarsal segment, and in other ways. They are distinguished from bi-denticulate individuals of *margaritum* in the key.

Notagonum iridior n. sp.

Description. With characters of genus as described above. Form of *Agonum s. s.*; piceous-black, legs and antennal bases slightly more reddish-piceous, outer antennal segments browner, lateral margins of prothorax and elytra somewhat translucent; surface moderately shining, elytra more iridescent than in any other species of genus except

perhaps *angulum* (below); microsculpture normal but finer than usual. *Head* .71 & .74 width prothorax; eyes large and prominent, with posterior supraocular setae about between their posterior edges. *Prothorax* rather transverse-subcordate, with apex more deeply emarginate than usual; width/length 1.48 & 1.44; base/apex 1.28 & 1.18; sides rounded for most of length, sinuate near posterior angles; latter obtuse (partly because of rounding of sides of base), blunted; lateral margins rather wide, flatter than usual anteriorly; basal foveae rather deep, only slightly roughened, vaguely punctate; anterior marginal line entire or nearly so, posterior one vague. *Elytra* of about normal outline and convexity, not or faintly impressed on disc; lateral margins moderate; subapical sinuations rather weak; apices each angulate opposite 3rd interval, then emarginate to sutural angle; latter denticulate; striae less impressed than usual, not distinctly punctulate; intervals nearly flat, 8th and 9th not much modified toward apex. *Lower surface* slightly punctate at sides of sterna; abdomen not pubescent. *Legs:* 4th hind-tarsal segment emarginate, not lobed. *Measurements:* length 8.0–9.0; width 3.0–3.5 mm.

Types. Holotype ♀ (M.C.Z. No. 28,616) and 3 paratypes (all ♀ ♀) all from Wasian, **Neth. N. G.**, Sept. 1939 (R. G. Wind).

Measured specimens. The ♀ holotype and 1 ♀ paratype.

Notes. The characters for recognition of this species are the iridescence of the elytra and the rather deep emargination of the front of the prothorax. Of the less obvious characters, the form of the 4th hind-tarsal segment (simply emarginate) is noteworthy, though repeated in a few other species of the genus.

Notagonum addendum n. sp.

Description. With characters of genus as described above. Form of rather broad *Agonum s. s.*; brownish-black, appendages brown, lateral margins of prothorax and elytra moderately translucent; surface moderately shining, not iridescent; microsculpture normal. *Head* .66 & .69 width prothorax; eyes large and prominent, with posterior supraocular setae a little before line of their posterior edges. *Prothorax* rather large and wide; width/length 1.52 & 1.53; base/apex 1.28 & 1.32; sides rather strongly arcuate for much of length, nearly straight and strongly converging and sometimes slightly sinuate before very obtuse but distinguishable basal angles; lateral margins rather wide especially toward base, moderately reflexed; basal foveae average, roughened but not distinctly punctate; anterior marginal line entire, posterior one more or less entire but vague at middle. *Elytra* rather broad, of normal outline and convexity, not distinctly impressed on disc; lateral margins

rather wide (in genus); subapical sinuations moderate; apices each strongly angulate about opposite 3rd interval (this angle more prominent than the sutural one), then obliquely subtruncate or slightly emarginate to slightly denticulate sutural angle; striae moderately impressed, not distinctly punctulate; intervals nearly flat or slightly convex, 8th and 9th not much modified toward apex. *Lower surface* virtually impunctate; abdomen not pubescent. *Legs:* 4th hind-tarsal segment deeply emarginate, with small outer but scarcely any inner lobe. *Measurements:* length 6.8–7.6; width 2.8–3.0 mm.

Types. Holotype ♂ (M.C.Z. No. 28,617) and 3 ♂♂ paratypes from Dobodura, **Papua**, Mar.–July 1944 (Darlington); and 2 paratypes from Mt. Nok, Waigeo Is., **Neth. N. G.**, 2,500 ft., Apr. & May 1938 (Cheesman).

Measured specimens. The ♂ holotype and 1 ♂ paratype from Dobodura.

Notes. This species is sufficiently distinguished from others in the key to species of *Notagonum*, above. In form and in shape of elytral apices it is so much like *Altagonum vallicola* n. sp. (below) that I at first thought it might be a form of that species which had retained the anterior pronotal and anterior dorsal elytral setigerous punctures, but the present new species differs from *vallicola* not only in possessing these setae and punctures but also in being less black in color, with more translucent lateral prothoracic and elytral margins, and in having small but distinct outer lobes on the 4th hind-tarsal segments.

Notagonum angulum n. sp.

Description. With characters of genus as described above. Form of rather slender *Agonum* or *Platynus*; piceous-black, browner-piceous below, appendages yellow or brownish-yellow, lateral margins of prothorax rather strongly pale-translucent, of elytra scarcely so; surface moderately shining and (especially elytra) moderately iridescent; microsculpture probably nearly normal but very light and restricted on pronotum and too fine to distinguish in detail at 54× on elytra. *Head* .77 & .80 width prothorax; eyes moderately large and prominent, with posterior supraocular setae about between their posterior edges. *Prothorax:* width/length 1.30 & 1.30; base/apex 1.18 & 1.23; sides arcuate anteriorly, nearly straight and converging posteriorly, usually slightly sinuate near posterior angles; latter obtuse, blunted or narrowly rounded; lateral margins moderate; basal foveae moderate, only slightly roughened; anterior marginal line entire, posterior one interrupted or vague at middle. *Elytra* rather long but otherwise of normal outline and convexity, not or slightly impressed on disc; lateral margins

normal; subapical sinuations moderate; apices each strongly, about rectangularly angulate (and sometimes subdenticulate) opposite 2nd or 3rd interval, then emarginate to more or less denticulate sutural angle; striae moderately deep, not distinctly punctulate; intervals slightly or moderately convex, 8th and 9th not much modified toward apex. *Lower surface* impunctate or nearly so; abdomen not pubescent. *Legs:* 4th hind-tarsal segment lobed, outer lobe longer than inner. *Measurements:* length 8.2–9.7; width 2.9–3.4 mm.

Types. Holotype ♂ (Leiden Mus.) and 16 paratypes from Rattan Camp, Snow Mts., **Neth. N. G.**, 1,150 & 1,200 m. (about 3,750 & 3,900 ft.), Feb.–Mar. 1939 (Toxopeus); and 6 paratypes from Sigi Camp, Snow Mts., 1,500 m. (about 4,875 ft.), Feb. 1939 (Toxopeus). (Some paratypes in M.C.Z., No. 28,618).

Other material. One teneral, Sigi Camp (as above); 1, Chimbu Valley, Bismarck Range, **N-E. N. G.**, 5,000–7,500 ft., Oct. 1944 (Darlington); 1, Mafulu, **Papua**, 4,000 ft., Dec. 1933 (Cheesman).

Measured specimens. The ♂ holotype and 1 ♀ paratype from Rattan Camp.

Notes. This fine species is easily known by its rather slender form (compared with related species), pale-translucent prothoracic margins, iridescent elytra, and strongly angulate elytral apices.

Notagonum subangulum n. sp.

Description. With characters of genus as described above. Form of rather slender *Agonum s. s.*; brownish-piceous (perhaps sometimes darker), appendages brownish-yellow, lateral margins of prothorax rather strongly translucent, of elytra much less so; surface moderately shining, only faintly iridescent; microsculpture normal, a little more distinct than in *angulum*. *Head* .77 & .77 width prothorax; eyes large and prominent, with posterior supraocular setae about between their posterior edges. *Prothorax* somewhat transverse; width/length 1.42 & 1.41; base/apex 1.36 & 1.33; sides arcuate anteriorly, converging and straight or faintly sinuate posteriorly; posterior angles obtuse, blunted or narrowly rounded; lateral margins moderate; basal foveae moderate, scarcely roughened; anterior marginal line entire, posterior one almost so. *Elytra* a little longer than usual but otherwise normal in outline and convexity; lateral margins average; subapical sinuations moderate; apices each strongly but a little obtusely angulate about opposite 3rd interval, then oblique forward to minutely or vaguely denticulate sutural angle; striae moderately impressed, not distinctly punctulate; intervals nearly flat or slightly convex, 8th and 9th not much modified toward apex. *Lower surface* not distinctly punctate; abdomen not

pubescent. *Legs:* 4th hind-tarsal segment lobed, outer lobe longer than inner. *Measurements:* length 7.7–8.2; width 2.7–3.0 mm.

Types. Holotype ♂ (Leiden Mus.) and 1 ♂ paratype (M.C.Z. No. 28,619) both from Sigi Camp, Snow Mts., **Neth. N. G.**, the type at 1,600 m. (about 5,200 ft.), Feb. 20, 1939, and the paratype at 1,500 m. (about 4,875 ft.), Feb. 1939 (both, Toxopeus).

Measured specimens. The types.

Notes. This species resembles the preceding (*angulum*) in a general way but differs in several details, especially in having a wider prothorax with relatively wider base (*cf.* ratios given in descriptions) and in having much less iridescent elytra.

Notagonum subrufum n. sp.

Description. With characters of genus as described above, except hind-tarsal sole with a nearly regular row of bristles each side, with middle of sole broadly bare. Form of slender *Agonum* (*Platynus*); rather dark rufous (elytra a little darker than head and prothorax), appendages yellow, lateral margins of prothorax and elytra moderately translucent; surface moderately shining, not iridescent; microsculpture faint on head, otherwise normal. *Head* .82 & .79 width prothorax; eyes moderately large and prominent, with posterior supraocular setae just behind line of their posterior edges. *Prothorax* rather narrow, subcordate; width/length 1.20 & 1.23; base/apex 1.12 & 1.11; sides rather weakly arcuate for much of length, then straight and converging posteriorly, and slightly or moderately sinuate before base; posterior angles obtuse (partly because sides of base obliquely rounded), slightly blunted; lateral margins average; basal foveae rather deep, slightly roughened, and basal area between foveae slightly depressed and roughened; anterior marginal line entire or slightly interrupted at middle, posterior one rather vague. *Elytra* rather narrow but otherwise of about normal outline and convexity; lateral margins rather narrow; subapical sinuations absent (except as margins turn onto spines); apices each with a spine opposite 3rd interval (the spine about as long as width of 1½ discal elytral intervals), with sutural angles broadly rounded, not denticulate; striae rather deep, not distinctly punctulate; intervals moderately convex, 8th and 9th not much modified toward apex. *Lower surface* impunctate; abdomen not pubescent. *Legs:* 4th hind-tarsal segment emarginate, very briefly (scarcely) lobed, outer lobe very slightly longer than inner; sole of hind tarsus as described above. *Male copulatory organs:* Fig. 32. *Measurements:* length 7.2–7.4; width 2.3 mm.

Types. Holotype ♂ (Leiden Mus.) and 1 ♀ paratype (M.C.Z. No.

28,620) both from Rattan Camp, Snow Mts., **Neth. N. G.**, 1,200 m. (about 3,900 ft.), Feb.–Mar. 1939 (Toxopeus).

Measured specimens. The types.

Notes. This fine little species is not closely related to any other known to me. It is sufficiently characterized in the key to species of *Notagonum*. It is probably not related to *Lorostemma*, although the hind tarsi are similarly clothed below.

Notagonum spinulum n. sp.

Description. With characters of genus as described above. Form of broad *Agonum s. s.*; black, appendages blackish, outer segments of antennae brown, lateral margins of prothorax and elytra not paler; surface moderately shining, not distinctly iridescent; microsculpture normal, light. *Head* .64 & .63 width prothorax; eyes large and prominent, with posterior supraocular setae between their posterior edges. *Prothorax* large and wide; width/length 1.52 & 1.59; base/apex 1.40 & 1.39; sides arcuate for most of length, usually slightly sinuate before base; posterior angles obtuse, more or less rounded; lateral margins relatively wide but less reflexed or elevated than usual; basal foveae wide, only moderately deep, only slightly roughened; anterior marginal line entire or nearly so, posterior one vague or interrupted at middle. *Elytra* broader than usual but otherwise of normal outline and convexity; lateral margins rather wide (in genus); subapical sinuations rather strong; apices each with a spine about opposite 3rd interval (spines about as long as width of 1½ discal elytral intervals), then emarginate to denticulate sutural angle; striae rather lightly impressed, not distinctly punctulate; intervals flat on disc, slightly convex laterally and apically, 8th and 9th not much modified toward apex. *Lower surface* impunctate or nearly so; abdomen not pubescent. *Legs:* 4th hind-tarsal segment emarginate and with very short lobes below, outer lobe a little longer than inner. *Male copulatory organs:* Fig. 33. *Measurements:* length 7.3–8.4; width 2.8–3.3 mm.

Types. Holotype ♂ (M.C.Z. No. 28,621) and 25 paratypes all from Dobodura, **Papua**, Mar.–July 1944 (Darlington), taken among dead leaves and in leaf mold on the ground in heavy rainforest.

Measured specimens. The ♂ holotype and 1 ♀ paratype.

Notes. The relatively broad form, black color, and spined elytra distinguish this species from all other *Notagonum* except the following one (*subspinulum*), *q.v.*

Notagonum subspinulum n. sp.

Description. With characters of genus as described above. Form of rather broad *Agonum s. s.*; black, appendages brownish, lateral margins of prothorax only slightly translucent, of elytra not distinctly so; surface moderately shining, not distinctly iridescent; microsculpture normal. *Head* .67 & .68 width prothorax; eyes large and prominent, with posterior supraocular setae about between their posterior edges. *Prothorax* moderately large; width/length 1.43 & 1.48; base/apex 1.33 & 1.35; sides arcuate anteriorly, nearly straight and converging posteriorly, slightly sinuate before base; posterior angles obtuse and finely blunted but somewhat better defined than in *spinulum*; lateral margins moderately wide, more reflexed than in *spinulum*; basal foveae rather deep, not much roughened; anterior marginal line entire, posterior one vague or interrupted at middle. *Elytra* of about normal outline and convexity, usually with disc a little impressed about ⅓ from base; lateral margins average; subapical sinuations rather strong; apices each with a very short spine or long tooth about opposite 3rd interval (spines about as long as width of 1 discal elytral interval), then emarginate to finely denticulate sutural angle; striae rather deep, not punctate; intervals moderately convex, 8th and 9th not much modified toward apex. *Lower surface* impunctate; abdomen not pubescent. *Legs:* 4th hind-tarsal segment emarginate, not lobed beneath. *Measurements:* length 6.8; width 2.5 mm.

Types. Holotype ♂ (M.C.Z. No. 28,622) and 1 ♂ paratype both from Dobodura, **Papua**, Mar.–July 1944 (Darlington).

Measured specimens. The types.

Notes. This species is generally similar to and probably related to the preceding (*spinulum*). It is from the same locality; I do not know whether it is from the same ecological habitat. It differs from *spinulum* in being smaller, less wide, with prothorax proportionately narrower (*cf.* proportions given in descriptions) and with less wide and more reflexed lateral margins and somewhat better defined posterior angles, elytra much more deeply striate and with shorter apical spines, and 4th hind-tarsal segment without the short lobes which are present in *spinulum*.

Genus Colpodes Macl.

Macleay 1825, Annulosa Javanica, p. 17.

Csiki 1936, Coleop. Cat., Carabidae, Harpalinae **5**, p. 745 (see for synonyms and additional references).

Jeannel 1948, Coléoptères Carabiques de la Région Malgache, Part 2, pp. 514, 515, 516.

Diagnosis. See key to genera.

Description. None required here. Genus as here restricted has *inner wings* always fully developed; seta-formula ++, ++, (+) (+)+; *secondary sexual characters* normal except in *rex* (which see); *male copulatory organs* of several species figured (Figs. 34–40).

Genotype. C. brunneus Macl. (*op. cit.*, p. 17, Pl. 1, Fig. 3) of Java. It should be noted that the species figured as *brunneus* by Jeannel (*op. cit.*, p. 514, Fig. 235a) is not that species and is not even closely related to it. True *brunneus* is apparently still known only from the single type, and is a peculiar, large, brown form, with small but abruptly prominent eyes and denticulate sutural angles of elytra. I have myself examined the type briefly at the British Museum, and I am indebted to Mr. E. B. Britton for additional notes on it.

Generic distribution. As here limited the genus is widely distributed from the Orient to northern Australia. Very many species of other tropical areas are now assigned to the genus, but it remains to be seen whether or not they are really congeneric with the Oriental forms.

Notes. It is obvious that the mass of diverse species now included in *Colpodes* should be broken up into genera or subgenera, and I have taken some steps toward breaking it up here, but only so far as the New Guinean forms are concerned. The eleven New Guinean species that I am leaving in *Colpodes* still present such a diversity of characters that I feel sure a further division will be necessary. It may well prove that none of the eleven is really congeneric with the genotype.

Jeannel (*loc. cit.*) has offered a table of the principal Oriental genera of Anchomenini (Agonini) which is concerned largely with components of the old *Colpodes*. I have already discussed this table, above, in notes under the tribe Agonini. It is superficial and otherwise unsatisfactory. In my opinion *Colpodes* will not be finally, satisfactorily divided until a large number of forms from many different regions are carefully studied and compared. This is something I should like to do some day, but it is far too big a task to undertake here.

Colpodes violaceus is a common lowland species. The other New Guinean species here assigned to the genus seem particularly characteristic of the lower and middle mountain slopes. In habits, they, or at least the ones that I know in life, are more arboreal or subarboreal than the species of *Notagonum*.

Key to the Species of Colpodes of New Guinea

1. Head relatively short, with short mandibles; prothorax wide, ½ or more wider than long, with base ⅓ or more wider than apex; size small, about 10 mm. or less; (form broad; color purple; each elytron with an apical spine about opposite 2nd interval) (p. 160) . . . . . *violaceus*

— Head longer, with relatively longer mandibles; prothorax narrower, with relatively narrower base; size larger, except in small specimens of *lactus* 2

2. Each elytron spined at outer angle (outside the subapical sinuation) as well as at sutural angle; (length about 13½ to 15 mm.; color blue or purple) (p. 161) ..... *saphyrinus sloanei*

— Outer angles of elytra not spined, rarely angulate, usually not defined . . 3

3. Each elytron with a spine at sutural angle, the spine longer than width of a discal elytral interval; (length 11.6–13.8 mm.; form slender, depressed; color rufopiceous; elytra very deeply striate) (p. 162) ..... *helluo*

— Elytra either not spined or with spines not at sutural angles (but latter sometimes denticulate) 4

4. Color at least partly green, blue, or purplish 5

— Color black or piceous 8

5. Strikingly bicolored: red, elytra blue or greenish with red apices; length about 9½–13 mm. (p. 163) ..... *lactus*

— Not thus bicolored; usually larger 6

6. Elytra not spined (but denticulate at sutural angles) and with outer intervals not compressed toward apex; length 13–17 mm. (p. 164) .... *habilis*

— Elytra *either* with outer intervals compressed toward apex *or* with short apical spines about opposite 3rd intervals; size still larger 7

7. Elytra with outer intervals (especially 8th) compressed to narrow carinae toward apex; apices not spined (but denticulate at sutural angles); length 18–21 mm. (p. 165) ..... *bennigseni*

— Elytra with outer intervals not compressed toward apex; each elytron with a short apical spine about opposite 3rd interval; length 19–23 mm. (p. 167) ..... *rex*

8. Elytra with outer angles (outside subapical sinuations) well defined, finely sub-rectangular (elytral apices also spined about opposite 3rd intervals) (p. 169) ..... *antedens*

— Elytra with outer angles not defined 9

9. Elytra with basal margin incomplete, only 1 dorsal puncture (the posterior one) present on 3rd interval, and with apices conspicuously angulate about opposite 2nd intervals, with points of angles usually slightly produced (p. 170) ..... *acuticauda*

— Elytra with anterior margin entire, 3 dorsal punctures on 3rd interval, and apices not conspicuously angulate 10

10. Elytra with strong subapical sinuations, and denticulate at sutural angles; length 13.6–14.8 mm. (p. 171) ..... *sinuicauda*

— Elytra with weak subapical sinuations, and not distinctly denticulate at sutural angles; length about 17–21 mm. (p. 172) ..... *simplicicauda*

Colpodes violaceus Chd.

Chaudoir 1859, Ann. Soc. Ent. France (3) 7, p. 351.
Andrewes 1930, Cat. Indian Carabidae, p. 126 (see for additional references).

Description. None required here. See key, above, for recognition-characters. *Male copulatory organs:* Fig. 34.

Type. From the **Aru** ("Arrou") **Islands**; Andrewes (*loc. cit.*) indicates that he has seen it in the Oberthür Collection.

Occurrence in New Guinea. **Papua:** 10, Milne Bay, Dec. 1943 (Darlington); 1, Oro Bay, Dec. 1943 Jan. 1944 (Darlington); 11, Dobodura, Mar.–July 1944 (Darlington); 9, Kokoda, 1,200 & 1,300 ft., May, Aug., Sept., & Oct. 1933 (Cheesman). **N-E. N. G.:** 1, Aitape, Aug. 1944 (Darlington). **Neth. N. G.:** 4, vicinity of Hollandia, July–Sept. 1944 (Darlington), and 2, same locality, Apr. 1945 (Malkin, U.S.N.M.); 1, Mt. Nomo, 700 ft., Feb. 1936 (Cheesman); 2, Bewani Mts. (1 at 400 m., or about 1,300 ft.), July & Sept. 1937 (W. Stüber, British Mus.); 1, Sabron, Cyclops Mts., 1,200 ft., May 15, 1936 (Cheesman); 1, Geelvink Bay (Raffray & Maindron, Paris Mus.); 2, Bernhard Camp, Snow Mts., 50 m. (about 160 ft.), July-Nov. 1938 (J. Olthof, Neth. Ind.–American Exp.); 14, Araucaria Camp, Snow Mts., 800 m. (about 2,600 ft.), Mar. 1939 (Toxopeus); 14, Rattan Camp, Snow Mts., 1,150 & 1,200 m. (about 3,750 & 3,900 ft.), Feb.-Mar. 1939 (Toxopeus); 1, Maffin Bay, Aug. 1944 (Darlington); 5, Sansapor (Vogelkop), Aug. 1944 (Darlington); 1, Mt. Nok, Waigeo Is., 2,500 ft., May 1938 (Cheesman). The species probably occurs at low altitudes throughout New Guinea. My specimens were all taken in forest, mostly in piles of dead leaves on the ground or in clumps of living or dead leaves on standing or fallen trees.

Notes. This easily recognized *Colpodes* is the only species of the genus, as here restricted, which is common and widely distributed in the lowlands of New Guinea. It is recorded also from the **Aru** and **Kei Islands** and the northeastern corner of **Australia**, and I have seen specimens from Cape Gloucester, **New Britain** (Darlington) and Malaita, **Solomon Islands** (American Mus.).

Colpodes saphyrinus sloanei Maindron

Colpodes papuensis Maindron (nec Sloane) 1908, Nova Guinea **5**, p. 298.
Colpodes sloanei Maindron 1908, Bull. Soc. Ent. France, p. 185.

Description (significant characters only). Very close to the well known Oriental *Colpodes saphyrinus* Chd.; form nearly the same; color similarly purplish-blue. *Head* .79 & .77 width prothorax, formed about as in *saphyrinus*. *Prothorax* subcordate; width/length 1.41 & 1.41; base/apex 1.21 & 1.22; slightly wider and flatter and with relatively slightly wider base than usual in *saphyrinus*; and lateral margins relatively wider. *Elytra* about as in *saphyrinus*; each with a moderate spine at sutural angle: but each elytron at outer angle (out-

side the subapical sinuation) with a second, shorter, slightly incurving spine rather than an acute tooth as in *saphrinus*. *Lower surface* with prosternal process angulate or subtuberculate at apex in lateral profile but not distinctly margined. *Legs* with hind tarsi a little more slender than in *saphyrinus* but otherwise about same; 4th hind-tarsal segment with long outer and shorter inner lobe; 5th hind-tarsal segment with fine, short, inconspicuous, but nevertheless distinct and regular accessory setae as in *saphyrinus*. *Measurements:* length 13.6–15.1; width 4.7–5.5 mm.

Type. From Cyclops Mts., **Neth. N. G.**; probably in Paris Mus.

Occurrence in New Guinea. **Papua:** 1♂, Kokoda, 1,200 ft., July 1933 (Cheesman); 3♀♀, Dobodura, Mar.–July 1944 (Darlington). **Neth. N. G.**; 1♂, considered a topotype, Mt. Lina, Cyclops Mts., 3,500–4,500 ft., Mar. 1936 (Cheesman); and 8, Rattan Camp, Snow Mts., 1,150 & 1,200 m. (about 3,750 & 3,900 ft.), Feb.–Mar. 1939 (Toxopeus). The specimens from Dobodura were all taken by beating masses of wilting leaves attached to the top of a small fallen tree in heavy forest.

Measured specimens. The ♂ from Kokoda, and 1 ♀ from Dobodura,

Notes. *Colpodes saphyrinus* and closely related forms at least some of which are perhaps to be considered subspecies (together constituting Jeannel's genus *Nesiocolpodes*, which may be recognizable, though not by the characters given by Jeannel) occur in different areas from the Indo-Chinese Subregion of the Orient through most of the Indo-Australian Archipelago, at least to the Philippines and New Guinea. The New Guinean form, *sloanei*, is best distinguished from the other members of the group by presence of a short spine rather than a mere tooth at the outer angle of each elytron.

Colpodes helluo n. sp.

Description. Form of a large, slender, flattened *Platynus* or of a slender helluonine; piceous or rufo-piceous, appendages a little paler, lateral margins of prothorax and elytra only slightly translucent; surface moderately shining, not iridescent; microsculpture scarcely visible on head and disc of pronotum, more distinct and isodiametric or only slightly transverse in basal foveae and along base and sides of pronotum, still more distinct and only slightly transverse on elytra. *Head* .82 & .81 width prothorax; eyes moderate in size and prominence, with posterior supraocular setae about between their posterior edges; front smooth, with anterior impressions slight; antennae long, normally formed; mentum tooth triangular with vaguely emarginate apex. *Prothorax* more or less cordate; width/length 1.28 & 1.30; base/apex

1.04 & 1.17; sides arcuate anteriorly, strongly sinuate well before basal angles; latter nearly right, but slightly blunted; lateral margins moderately wide and rather strongly reflexed; basal foveae deep, slightly wrinkled but not distinctly punctate; disc normal, impunctate; anterior marginal line distinct and entire, posterior one less well defined but more or less entire. *Elytra* long, almost parallel, depressed; basal margin entire, slightly angulate at humeri; lateral margins moderate; subapical sinuations rather strong; apices bluntly subangulate about opposite 3rd striae, then briefly subtruncate, then strongly spined at sutural angles, the spines a little longer than width of a discal elytral interval; striae very deep, entire, vaguely punctulate; intervals convex, 8th and 9th not much modified toward apex, 3rd with usual 3 dorsal punctures, the anterior one a little farther back than usual. *Lower surface* impunctate or nearly so; abdomen not pubescent; prosternal process normal, simple. *Legs:* hind tarsi slender, with first 4 segments sulcate each side above; 4th hind-tarsal segment shallowly emarginate, not lobed; 5th hind-tarsal segment without obvious accessory setae below. *Male copulatory organs:* Fig. 35. *Measurements:* length 11.6–13.8; width 3.8–4.5 mm.

Types. Holotype ♂ (Leiden Mus.) and 1 ♀ paratype (M.C.Z., No. 28,623) both from Rattan Camp, Snow Mts., **Neth. N. G.**, 1,150 m. (about 3,750 ft.), Feb.–Mar. 1939 (Toxopeus).

Measured specimens. The types.

Notes. Characters for the identification of this species are given in the key, above. In appearance it is unlike any other species of Agonini known to me.

Colpodes laetus (Er.)

Anchomenus laetus Erichson 1834 (1835), Nov. Act. Akad. Caesareae Leopoldino-Carolinae Germanicae Naturae Curiosorum **16**, Suppl. p. 222, Pl. 37, Fig. 2.

Colpodes laetus Andrewes 1930, Cat. Indian Carabidae, p. 123 (see for synonymy and additional references).

Description (significant characters only). Form rather *Platynus*-like; color red, with elytra bright green or blue and with red apices. *Head* .76 & .73 width prothorax. *Prothorax:* width/length 1.31 & 1.30; base/apex 1.25 & 1.22. *Elytra* with outer intervals scarcely modified toward apex. *Legs:* hind tarsi with first 4 segments sulcate each side above; 4th hind-tarsal segment with a moderate outer and shorter inner lobe; 5th hind-tarsal segment without obvious accessory setae. *Male copulatory organs:* Fig. 36. Although it is strikingly colored, the species notably lacks striking or unusual structural characters. *Measurements:* length about 9½–13; width about 3½–4½ mm

Type(s). From Luzon in the **Philippines**; in Zoological Mus., Berlin (seen by Andrewes, 1927).

Occurrence in New Guinea. **Papua:** 4, Dobodura, Mar.–July 1944 (Darlington). **Neth. N. G.:** 1, Hollandia, May 1945 (B. Malkin, U.S.N.M.); 2, Bewani Mts., 400 m. (about 1,300 ft.), July 1937 (W. Stüber, British Mus.); 2, Toem (Maffin Bay), Mar. 1945 (D. B. Vogtman, U.S.N.M.); 5, "Neth. New Guinea" without further locality, "jungle vege.", 225 ft., Oct. 10, 1944 (T. Aarons), Nov. 10, 1944 (T. Aarons), and Dec.–Feb. 1945 (H. A. Levy) (all in American Mus.). The Dobodura specimens were all taken at light.

Measured specimens. One ♂ and 1 ♀ from Dobodura.

Notes. I have seen this species also from Luzon, Leyte, and Mindanao in the **Philippines**; **Celebes** (Andrewes Coll., British Mus.); Bougainville (M.C.Z. & U.S.N.M.) and Kulambangra (British Mus.) in the **Solomons**; and Espiritu Santo, **New Hebrides** (American Mus. and California Acad.).

The coloration of this species is like that of *Euplenes apicalis* (above), but the *Colpodes* is of course much larger (about 9½–13 mm.), with different generic characters (see key to genera, above). It is nearly matched in color also by *Colpodes felix* Andr., known from Buru and the Philippines, but *felix* is much smaller and broader, with different technical characters, probably related to *C. ruficeps.*

C. laetus is a somewhat variable species, but I am not able to divide it into distinct subspecies. In the nine Philippine specimens now before me the elytra are bright green (except of course for the red apices). In most specimens from New Guinea, the Solomons, and the New Hebrides the main elytral color is blue rather than green, but some greenish specimens occur in the New Guinean series. Variation in proportions and in shape of prothorax seems to be more individual than geographical. In some New Guinean specimens the elytra are distinctly denticulate at sutural angles (as usual in the Philippines) but in other New Guinean specimens there is almost no trace of the denticles. Both forms occur in my short series from Dobodura.

Colpodes habilis Sl.

Sloane 1907, Deutsche Ent. Zeits., pp. 178 & 179.
Andrewes 1930, Treubia **7**, Suppl., pp. 333 & 338.
van Emden 1937, Stettiner Ent. Zeit. **98**, p. 34.

Description (Significant characters only). A large (about 13–17 mm.) *Colpodes* with greenish, bluish, or purplish elytra which are not spined but denticulate at sutural angles, with outer intervals not much modified toward apex. *Head* .72 & .73 width prothorax. *Prothorax:* width/

length 1.34 & 1.35; base/apex 1.16 & 1.22. *Legs:* hind tarsi slender, with first 4 segments deeply sulcate each side above; 4th hind-tarsal segment with a moderate outer and shorter inner lobe; 5th hind-tarsal segment without obvious accessory setae, but sometimes (perhaps always) with vestigial ones. *Male copulatory organs:* Fig. 37. *Measurements:* length about 13–17; width about 4½–6 mm.

Type. From Sattelberg, **N-E. N. G.**; presumably in Deutsches Entomologisches Institut, Berlin-Dahlem, Germany.

Occurrence in New Guinea. **Papua:** 1, Mafulu, 4,000 ft., Dec. 1933 (Cheesman); 1, Mondo, 5,000 ft., Jan.–Feb. 1934 (Cheesman); 2, Palmer River at Black River, June 7–14, 1936 (Archbold Exp., American Mus.); 1, Mt. Mabiom, July 15, 1936 (Archbold Exp., American Mus.). **N-E. N. G.:** 1, Sattelberg (topotype) (British Mus.). **Neth. N. G.:** 2, Hollandia, 250 ft., Nov. 11, 1944 & May 1945 (H. Hoogstraal, M.C.Z.); 1, same locality, 300–600 m. (about 975–1,950 ft.), Jan. 1938 (W. Stüber, British Mus.); 3, Bewani Mts., 400 m. (about 1,300 ft.), July & Sept. 1937 (W. Stüber, British Mus.); 1, Pukusam Dist. (W. of Tami River), June 1937 (W. Stüber, British Mus.); 1, Mt. Cyclops, 3,500 ft., Mar. 1936 (Cheesman); 21, Araucaria Camp, Snow Mts., 800 m. (about 2,600 ft.), Mar. 1939 (Toxopeus); 24, Rattan Camp, Snow Mts., 1,150 & 1,200 m. (about 3,750 & 3,900 ft.), Feb.–Mar. 1939 (Toxopeus); 1, Sigi Camp, Snow Mts., 1,500 m. (about 4,875 ft.), Feb. 1939 (Toxopeus); 2, Mist Camp, Snow Mts., 1,800 m. (about 5,850 ft.), Jan. & Feb. 3, 1939 (Toxopeus); 10, Mt. Baduri, Japen Is., 1,000 ft., Aug. 1938 (Cheesman); 1, Wasian, Sept. 1939 (R. G. Wind, M.C.Z.); 2, Mt. Nok, Waigeo Is., 2,500 ft., May 1938 (Cheesman).

Measured specimens. One pair (♂ ♀) from Rattan Camp.

Notes. This species is recorded also from **Buru** (Andrewes 1930); I have seen specimens from Cape Gloucester, **New Britain** (Darlington), and from Guadalcanar Is., **Solomons** (J. A. Kusche, Bishop Mus.); and it is recorded also from Vanikoro, **Santa Cruz Islands** (van Emden 1937).

Colpodes bennigseni Sl.

Sloane 1907, Deutsche Ent. Zeits., pp. 177 & 179.
Colpodes louwerensi Andrewes (new synonym).
Andrewes 1937, Bull. Ann. Soc. Ent. Belgique **77**, pp. 39 & 41.
Louwerens 1949, Tijd. v. Ent. **90**, p. 45.

Description (significant characters only). Very large (about 18–21 mm.); color black, elytra with strong purple or green reflections which vary somewhat in different individuals and more in different lights,

appendages dark. *Head* .82 & .84 (.81) width prothorax. *Prothorax* rather narrow and narrowly margined; width/length 1.17 & 1.19 (1.19); base/apex 1.09 & 1.11 (1.08) if base measured between posterior-lateral setae, but base actually slightly narrower than apex if measured between apparent (but rounded) basal angles, which are behind the setae; sides moderately arcuate anteriorly, faintly or not distinctly angulate at anterior-lateral setae, nearly straight and rather strongly converging in more than posterior half; anterior and posterior marginal lines entire. *Elytra* rather ample, with weak subapical sinuations, strongly rounded lobes or blunt angulations at apex about opposite 3rd intervals, and denticles at sutural angles; 3rd interval with 3 dorsal punctures but anterior one a little farther forward and others farther backward than normal, the posterior one being very far back, on the declivity; 7th interval toward apex much narrowed but somewhat variable, 8th toward apex compressed to a narrow costa, and 9th narrow and much interrupted by ocellate foveae. *Legs:* hind tarsi with first 4 segments very deeply impressed on each side (and so 3-carinate) above; 4th hind-tarsal segment with a moderate outer and shorter inner lobe; 5th hind-tarsal segment without obvious accessory setae but with minute vestigial ones. *Measurements:* length about 18–21; width about 6½–7¾ mm.

Types. That of *bennigseni* from Sattelberg, **N-E. N. G.**, should be in the Deutsches Entomologisches Institut, Berlin-Dahlem, Germany. That of *louwerensi*, from **Bali**, is in the Andrewes Collection in the British Museum, where I have seen it.

Occurrence in New Guinea. **Papua:** 1, Mafulu, 4,000 ft., Dec. 1933 (Cheesman); 1, Mondo, 5,000 ft., Jan.–Feb. 1934 (Cheesman). **Neth. N. G.:** 2, Humboldt Bay Dist., 1937 (W. Stüber, British Mus.); 1, Bewani Mts., Sept. 1937 (W. Stüber, British Mus.); 1, Pukusam Dist. (W. of Tami River), June 1937 (W. Stüber, British Mus.); 1, Hollandia, Jan.–Mar. 1939 (Toxopeus); 12, Araucaria Camp, Snow Mts., 800 m. (about 2,600 ft.), Mar. 1939 (Toxopeus); 58, Rattan Camp, Snow Mts., 1,150 & 1,200 m. (about 3,750 & 3,900 ft.), Feb.–Mar. 1939 (Toxopeus); 1, Mist Camp, Snow Mts., 1,800 m. (about 5,850 ft.), Jan. 1939 (Toxopeus); 4, Mt. Baduri, Japen Is., 1,000 ft., Aug. 1938 (Cheesman).

Measured specimens. One pair (♂ ♀) from Rattan Camp, and in parentheses a ♀ cotype of *louwerensi* from Bali.

Notes. Outside of New Guinea this species is known from **Bali** (types of *louwerensi*); **Java** (Louwerens 1949); **Celebes** (♂ ♀ received from Louwerens); and Malaita, **Solomon Islands** (1 ♀, American Mus.). I have carefully compared a ♀ cotype of *louwerensi* from Bali with New Guinean specimens of *bennigseni* and find no differences that seem to be of even subspecific value.

Colpodes rex n. sp.

Description. Very large; near average form and convexity for genus; black, pronotum and elytra green or blackish-green or purple-green (varying a little in different individuals but more at different angles), appendages dark; lateral margins of pronotum and elytra invaded by metallic color, not translucent; surface rather shining, not iridescent; microsculpture indistinct on head (but latter with a very little fine, sparse punctulation), light and transverse on pronotum, very fine and transverse on elytra. *Head* .78 & .77 width prothorax; eyes large and prominent, with posterior supraocular setae a little in front of line of posterior edges of eyes; front smooth, with anterior impressions rather shallow and irregular; antennae not very long (in genus), normally formed; mentum tooth triangular. *Prothorax* subhexagonal; width/length 1.31 & 1.24; base/apex 1.05 & .99 if base measured across posterior-lateral setae, but slightly less than .90 if base measured across apparent posterior angles, which are behind the setae; sides slightly arcuate and converging forward anteriorly, subangulate before middle (at anterior-lateral setae), then nearly straight and strongly converging backward, and sometimes slightly sinuate before posterior angles; latter obtuse, narrowly rounded; lateral margins rather narrow especially posteriorly, moderately reflexed; basal foveae not distinct from posterior ends of lateral margins, impunctate; disc with light median and deeper transverse impressions, impunctate; anterior and posterior marginal lines entire, well marked. *Elytra* long, moderately wide, convex, with sides subparallel, only faintly arcuate for most of length; basal margin entire, rounded at humeri; lateral margins narrow; subapical sinuations slight or absent; apices each with a short spine about opposite 3rd stria, then emarginate to denticulate sutural angle; striae fine and light, very finely punctulate, 1st deeper at base and apex, 5th in a depression toward base; intervals flat, scarcely modified toward apex except that 8th tends to overhang 9th at outer posterior curve of elytron; 3rd interval almost normally 3-punctate except posterior puncture farther back than usual, behind apical ¼. *Lower surface* impunctate; abdomen not pubescent; prosternal process simple. *Legs:* posterior tibiae not sulcate along outer edges; posterior tarsi with first 4 segments above lightly but distinctly sulcate on outer side but less distinctly or not sulcate on inner side especially in ♂; 4th hind-tarsal segment rather deeply emarginate but hardly lobed, inner and outer apical angles nearly equal; 5th hind-tarsal segment without obvious accessory setae. *Secondary sexual characters* normal except ♀ usually with 3 (instead of 2) setae each side last ventral segment. *Measurements:* length 19–23; width 6.5–7.7 mm.

Types. Holotype ♂ (British Mus.) and 10 paratypes (British Mus., & M.C.Z., No. 28,624) from Bewani Mts., Humboldt Bay Dist., **Neth. N. G.**, Sept. (some paratypes July) 1937 (W. Stüber). Additional paratypes as follows: **Neth. N. G.:** 1, Pukusam Dist. (W. of Tami R.), June 1937 (W. Stüber, British Mus.); 1, Mt. Cyclops, 3,500 ft., Mar. 1936 (Cheesman); 1, Araucaria Camp, Snow Mts., 800 m. (about 2,600 ft.), Mar. 1939 (Toxopeus); 18, Rattan Camp, Snow Mts., 1,150 & 1,200 m. (about 3,750 & 3,900 ft.), Feb.–Mar. 1939 (Toxopeus); 2, Sigi Camp, Snow Mts., 1,500 m. (about 4,875 ft.), Feb. 22, 1939 (Toxopeus); 20, Mist Camp, Snow Mts., 1,800 m. (about 5,850 ft.), Jan. 1939 (Toxopeus); 1, Top Camp, Snow Mts., 2,100 m. (about 6,825 ft.), Jan. 22, 1939 (Toxopeus); 2, Mt. Baduri, Japen Is., 1,000 ft., Aug. 1938 (Cheesman); 3, Mt. Nok, Waigeo Is., 2,500 ft., May 1938 (Cheesman). **N-E. N. G.:** 1, Wamoro (not located on map) (British Mus., marked "*Colpodes sp. nov.*?" by Andrewes). **Papua:** 1, Mafulu, 4,000 ft., Dec. 1933 (Cheesman); 4, Fly R. 5 mi. below Palmer R., May 14–31, 1936 (Archbold Exp., American Mus.); 1, Palmer R. at Black R., June 15–22, 1936 (Archbold Exp., American Mus.); 1, Mt. Mabiom, July 15, 1936 (Archbold Exp., American Mus.). The records suggest that this is a species of the lower and middle mountain slopes, and that it commonly extends to higher altitudes than *habilis* or *bennigseni*.

Measured specimens. The ♂ holotype and 1 ♀ paratype from the Bewani Mts.

Notes. This magnificent species is apparently related to the preceding (*bennigseni*), which it resembles in large size and striking appearance and in at least two significant technical characters: the position of the apparent posterior angles of the prothorax (behind the posterior-lateral setae) and the position of the posterior punctures of the 3rd elytral intervals (unusually far back, though not so far back as in *bennigseni*). However *rex* differs from *bennigseni* not only in such specific characters as presence of metallic color on pronotum as well as elytra, relatively narrower head, more hexagonal prothorax, finer elytral striae, and presence of apical elytral spines, but in certain other characters which are surprising if the species are really closely related. For example, the outer elytral intervals especially near apex are strongly compressed in *bennigseni* but not in *rex;* and the hind tarsi are strongly sulcate on both sides above in *bennigseni* but only lightly so or sometimes not distinctly sulcate at all on the inner side in *rex*.

Colpodes antedens n. sp.

Description. Form almost of *Agonum* (*s. s.*) but larger, more elongate, with relatively longer head and spined elytra; black, appendages dark; lateral margins of prothorax and elytra vaguely or not translucent; surface moderately shining, not iridescent; microsculpture of head faint, nearly isodiametric; of pronotum faint; of elytra more distinct, of rather large, only slightly transverse meshes. *Head* .70 width prothorax; eyes moderately large and prominent; genae short, oblique, not prominent; posterior supraocular setae about between posterior edges of eyes; front smooth, impressed on each side anteriorly; antennae rather long and slender, normally formed; mentum tooth narrowly triangular with slightly blunted apex. *Prothorax:* width/length 1.40; base/apex 1.21; sides evenly arcuate for most of length, almost straight and converging before basal angles; latter obtuse but only slightly blunted; lateral margins rather wide and rather strongly reflexed; basal foveae deep, vaguely roughened or subpunctate; disc with usual impressions, impunctate; anterior and posterior marginal lines entire. *Elytra* rather long, normally convex, with sides only slightly arcuate for most of length; basal margin entire, obtusely angulate at humeri; lateral margins moderate; outer angles distinct, almost right; subapical sinuations emarginate; apices spined opposite ends of 3rd intervals, then obliquely emarginate to slightly obtuse (nearly right) sutural angles; spines slightly longer than width of 1 discal interval; striae moderately deep, finely punctulate; intervals convex, 8th and 9th not much modified toward apex; 3rd normally 3-punctate. *Lower surface* impunctate; abdomen not pubescent; prosternal process simple. *Legs:* hind tibiae not sulcate along outer edges; hind tarsi slender, lightly sulcate each side above; 4th hind-tarsal segment deeply emarginate, outer and inner angles prominent, about equal; 5th hind-tarsal segment with short and inconspicuous but distinct accessory setae below. *Male copulatory organs* as figured (Fig. 38). *Measurements:* length 16.6; width about 6 mm.

Type. Holotype ♂ (British Mus.) from Mt. Lina, Cyclops Mts., **Neth. N. G.**, 3,500 ft., Mar. 1936 (Cheesman); unique.

Measured specimen. The type.

Notes. This species should be easily recognized by characters given in the key to species of *Colpodes*, above. It resembles the following ones (*acuticauda, sinuicauda, simplicicauda*) in being rather large and black, but I am not sure it is really related to any of them, nor am I sure that the latter are related among themselves. It (*antedens*) is notable not only for having the outer angles of the elytra well defined, but also for possessing distinct, though very small, accessory setae on the 5th hind-tarsal segments.

Colpodes acuticauda n. sp.

Description. Large; black, appendages black or piceous; surface rather dull, faintly silky but not iridescent; microsculpture fine but distinct, isodiametric on head, only slightly transverse on pronotum and elytra; upper surface also faintly, sparsely punctulate. *Head* .76 & .77 width prothorax; eyes smaller than usual in genus but prominent; genae angulately prominent in profile; posterior supraocular setae about between posterior edges of eyes; vertex transversly impressed; front a little irregular, with very slight anterior impressions; antennae of moderate length, normally formed; mentum tooth triangular, with apex rounded. *Prothorax:* width/length 1.38 & 1.44; base/apex 1.07 & 1.06; sides arcuate for most of length, variably sinuate before somewhat obtuse but well defined posterior angles; lateral margins moderate, rather strongly reflexed especially posteriorly; basal foveae moderate or rather shallow, not punctate; disc less convex than usual, impunctate; anterior and posterior marginal lines vague or obsolete. *Elytra* of about normal proportions, slightly more convex than usual; sides subparallel for much of length; basal margin incomplete, obliterated inwardly from bases of 5th or 4th striae; lateral margins rather narrow; outer angles not defined; subapical sinuations almost absent; apices strongly angulate opposite 2nd intervals, with angles usually slightly produced into acute denticles; sutural angles not defined (unless the aforementioned angulations are sutural angles displaced outward); striae rather deep, impunctate; intervals moderately convex, 8th narrowed and longitudinally impressed toward apex, 9th widened and irregular toward apex; 3rd interval with only 1 dorsal puncture, far back, at top of declivity. *Lower surface* impunctate; abdomen with a little fine pubescence irregularly distributed; prosternal process simple. *Legs:* posterior tibiae not sulcate along outer edges; posterior tarsi slender, sulcate each side above; 4th hind-tarsal segment deeply emarginate, outer angle forming a very short lobe, slightly longer than inner one; 5th hind-tarsal segment without obvious accessory setae below. *Male copulatory organs:* Fig. 39. *Measurements:* length 17.6–18.3; width about 6 or slightly more mm.

Types. Holotype ♀ (British Mus.) and 1 ♀ paratype (M.C.Z., No. 28,625) from Mt. Tafa, **Papua**, 8,500 ft., Mar. 1934 (Cheesman); and 1 ♂ paratype from Top Camp, Snow Mts., **Neth. N. G.**, 2,100 m. (about 6,825 ft.), Jan. 22, 1939 (Toxopeus).

Measured specimens. The ♀ holotype and ♂ paratype.

Notes. This very distinct new species has several characters (form of eyes and genae, reduction of basal margin of elytra, reduction of dorsal punctures of elytra, dullness of surface) which suggest that it may be near the ancestral stock of *Idiagonum* (new genus described

below), but it is still much more of a *Colpodes* than an *Idiagonum*, with eyes still only a little modified, one dorsal elytral puncture still remaining, no added 10th elytral interval, no setae on prosternal process, and fully developed inner wings.

Colpodes sinuicauda n. sp.

Description. Rather large; black, appendages dark, lateral margins of prothorax slightly and of elytra scarcely translucent; surface moderately shining, not iridescent; microsculpture rather light, isodiametric on head, transverse on pronotum, very fine and transverse on elytra. *Head* .79 & .79 width prothorax; eyes much smaller and somewhat less prominent than usual in genus; genae long, oblique, nearly straight but with a slight sinuation (in profile) posteriorly; posterior supraocular setae a little behind line of posterior edges of eyes; front nearly smooth, a little irregular and slightly impressed each side anteriorly; antennae moderately long, normally formed; mentum tooth absent in both specimens. *Prothorax:* width/length 1.33 & 1.43; base/apex 1.06 & 1.06; sides moderately or strongly arcuate for much of length, strongly sinuate well before slightly acute basal angles; lateral margins moderate, moderately reflexed; basal foveae average, impunctate; disc normal, impunctate; anterior and posterior marginal lines present but vague. *Elytra* of normal proportions, normally convex, with sides slightly arcuate; basal margin entire, faintly angulate at humeri; lateral margins moderately wide; outer angles not defined; subapical sinuations strong; apices strongly rounded or subangulate about opposite 3rd intervals, then subtruncate to more or less plainly denticulate sutural angles; striae well impressed, not distinctly punctulate; intervals slightly convex, 8th and 9th not much modified toward apex; 3rd interval normally 3-punctate. *Lower surface* nearly impunctate, but abdomen with a little fine scattered punctation (apparently without pubescence) especially on segments 3 & 4; prosternal process simple. *Legs:* posterior tibiae not sulcate along outer edges; posterior tarsi apparently stouter in ♂ than in ♀, not distinctly sulcate above; 4th hind-tarsal segment with rather long outer and shorter inner lobe; 5th hind-tarsal segment without obvious accessory setae below. *Male copulatory organs:* Fig. 40. *Measurements:* length 13.6–14.8; width 4.8–5.3 mm.

Types. Holotype ♂ (Leiden Mus.) from Sigi Camp, Snow Mts., **Neth. N. G.**, 1,500 m. (about 4,875 ft.), Feb. 24, 1939 (Toxopeus); and 1 ♀ paratype (M.C.Z., No. 28,626) from Lower Mist Camp, Snow Mts., 1,700 m. (about 5,525 ft.), Jan. 17, 1939 (Toxopeus).

Measured specimens. The types.

Notes. Besides the key characters, which are distinctive enough, this species possesses one characteristic which, so far as I know, is unique in *Colpodes* even in the broadest sense: absence of the usual mentum tooth. However, I do not want to stress this too much. The tooth may possibly be broken off, although that this should have happened in the same way in both specimens seems unlikely.

Colpodes simplicicauda n. sp.

Description. Very large; black, appendages dark, lateral margins of prothorax and elytra vaguely or not translucent; surface moderately shining, not iridescent; microsculpture indistinct on head, light and moderately transverse on pronotum, heavier but only moderately transverse on elytra; surface of head, pronotum, and elytra also with very fine, sparse, inconspicuous punctulation. *Head* .81 & .79 width prothorax; eyes much smaller and less prominent than usual in genus; genae long, oblique, slightly sinuate in profile (transversely swollen in side view) posteriorly; posterior supraocular setae slightly behind line of posterior edges of eyes; head rather deeply transversely impressed posteriorly; front slightly, irregularly wrinkled and very slightly impressed each side anteriorly; antennae moderately long, normally formed; mentum tooth triangular with apex blunted or vaguely emarginate. *Prothorax:* width/length 1.31 & 1.37; base/apex .96 & 1.02; sides moderately or weakly arcuate for much of length, broadly or moderately sinuate before nearly right, well formed basal angles; lateral margins moderately wide, normally reflexed; basal foveae normal, impunctate; disc normal, slightly and superficially transversely wrinkled, impunctate (except for fine, sparse punctulation mentioned above); anterior and posterior marginal lines entire, well impressed. *Elytra* rather long, of normal width and convexity, nearly parallel-sided; basal margin entire, not distinctly angulate at humeri; lateral margins rather narrow; outer angles not defined; subapical sinuations weak; apices nearly conjointly rounded, with sutural angles slightly dehiscent, not denticulate; striae moderately impressed, not distinctly punctate; intervals slightly convex, 8th rather strongly narrowed and more convex toward apex and 9th slightly widened toward apex (but these intervals still not very much modified toward apex); 3rd interval normally 3-punctate, but posterior puncture rather far back, at top of declivity. *Lower surface* impunctate; abdomen not pubescent; prosternal process normal. *Legs:* posterior tibiae not or vaguely sulcate along outer edges; posterior tarsi rather lightly sulcate each side above (inner sulcus sometimes almost obliterated, especially in ♂); 4th hind-tarsal segment with rather long

outer and shorter inner lobe; 5th hind-tarsal segment without obvious accessory setae below. *Measurements:* length about 17–21; width 5.7–7.0 mm.

Types. Holotype ♂ (Leiden Mus.) and 1♂ paratype (M.C.Z., No. 28,627) from Ibele (Iebele) Camp, Snow Mts., **Neth. N. G.**, 2,250 m. (about 7,325 ft.), Nov.–Dec. 1938 (Toxopeus); 5 paratypes (all ♀ ♀) from Mist Camp, Snow Mts., 1,800 m. (about 5,850 ft.), various dates in Jan. 1939 (Toxopeus); 1 ♀ paratype from Sigi Camp, Snow Mts., 1,500 m. (about 4,875 ft.), Feb. 17, 1939 (Toxopeus); and 1 ♀ paratype from Saiko (Bubu R., Upper Waria R.), **N-E. N. G.**, 5,500–6,000 ft., Sept.–Oct. 1936 (F. Shaw-Mayer, British Mus.).

Measured specimens. The ♂ holotype, and 1 ♀ paratype from Mist Camp.

Notes. This species should be easily identifiable by characters given in the key to species of *Colpodes*, above. It lacks the conspicuous or unusual structural peculiarities which define, in different ways, the three preceding species.

Plicagonum new genus

Diagnosis. See key to genera.

Description. Rather large (14.3–18.5 mm.), somewhat *Platynus*-like (Fig. 3), brownish forms with fully developed wings and all usual supraocular and pronotal setae; surface above virtually impunctate except for fine punctulation on head and pronotum; microsculpture absent on head, almost absent on pronotum, rather fine but deeply impressed and not or only slightly transverse on elytra. *Head* only moderately elongate, with large prominent eyes; posterior supraocular setae at or in front of line of posterior edges of eyes; front strongly but irregularly longitudinally wrinkled between eyes; anterior frontal impressions slight; antennae rather slender, normal in structure; mentum tooth triangular with apex more or less (irregularly) blunted. *Prothorax* normal. *Elytra* margined at base; fully striate; 3rd interval normally 3-punctate except anterior puncture missing on one or both sides in several individuals: 8th & 9th intervals not much modified toward apex; subapical sinuations weak; apices variable as described in species. *Inner wings* fully developed. *Lower surface* virtually impunctate; abdomen not pubescent; prosternal process normal. *Legs* normally formed; hind tibiae not sulcate along outer edges; hind tarsi slender, sulcate each side above (but sulci, especially inner one, sometimes faint); 4th hind-tarsal segment deeply emarginate, with short lobes, outer one scarcely longer than inner; 5th hind-tarsal segment without obvious accessory setae; claws simple; sole clothed with

numerous setae not in regular rows but with middle of sole narrowly bare. *Secondary sexual characters* normal. *Male copulatory organs* as figured (Figs. 41 & 42).

Genotype. Plicagonum fulvum n. sp. (below).

Generic distribution. Mountains of New Guinea.

Notes. This genus, though not very different from *Colpodes* even as here restricted and perhaps actually of only subgeneric value, is distinguished especially by the longitudinal wrinkling of the head, and is a natural group which has undergone more or less radiation at rather high altitudes in New Guinea. I here describe only two forms of the genus, but my few scattered specimens of *rugifrons* are so variable as to suggest that this species will be found to break up into distinct subspecies on different mountain ranges.

Key to the Species of Plicagonum

Elytral apices spined or at least acutely angulate about opposite 3rd intervals (p. 174) ..... *rugifrons*

Elytral apices neither spined nor acutely angulate opposite 3rd intervals (p. 175) ..... *fulvum*

PLICAGONUM RUGIFRONS n. sp.

Description. With characters of genus as described above. Brownish-piceous, elytra usually (not always) browner with piceous apices and sometimes faintly striped (with striae piceous and middles of intervals brown), appendages brown, lateral margins of prothorax moderately translucent. *Head* .72 & .73 width prothorax. *Prothorax:* width/length 1.40 & 1.40; base/apex 1.22 & 1.20; sides variably arcuate anteriorly, nearly straight and converging and sometimes faintly sinuate posteriorly; basal angles moderately to very obtuse; lateral margins rather wide but only slightly reflexed (a little more so toward base); basal foveae rather small but deep, sometimes slightly wrinkled but not punctate; disc with very light median longitudinal line and deep anterior and posterior transverse impressions, impunctate; anterior and posterior marginal lines entire, deeply impressed. *Elytra* rather ample, more convex than usual in *Colpodes*, nearly parallel-sided (slightly narrowed anteriorly); basal margin rounded or faintly angulate at humeri; lateral margins narrow; apices each with an acute tooth or short spine opposite 3rd interval, then emarginate to sutural angle; latter vaguely or distinctly denticulate; striae not deeply impressed, not distinctly punctulate; intervals nearly flat to slightly convex. *Male copulatory organs:* Fig. 41. *Measurements:* length about 17.5–18.5; width 6.1–6.4 mm.

Types. Holotype ♂ (Leiden Mus.) and 2 ♀♀ paratypes (1 in M.C.Z., No. 28,628) all from Top Camp, Snow Mts., **Neth. N. G.**, 2,100 m. (about 6,825 ft.), Jan. 22 (type), Jan. 26, & Feb. 2, 1939 (Toxopeus).

Other material. One ♀, Mt. Misim, Morobe Dist., **N-E. N. G.** (Stevens, M.C.Z.); and 1 ♀, Mt. Tafa, **Papua**, 8,500 ft., Mar. 1934 (Cheesman).

Measured specimens. The ♂ holotype and 1 ♀ paratype.

Notes. This species is defined and discussed in the key and under the generic description, above.

Plicagonum fulvum n. sp.

Description. With characters of genus as described above. Form as figured (Fig. 3); brownish- or reddish-piceous, elytra typically rather pale-brown with darker apices and sometimes also with stripes along striae slightly darker (Moss Forest Camp specimens have elytra less contrastingly pale); appendages light-brown; lateral margins of prothorax broadly translucent. *Head* .76 & .79 width prothorax; front in types a little less wrinkled especially at middle than in *rugifrons* (but strongly wrinkled in Moss Forest Camp specimens of *fulvum*). *Prothorax:* width/length 1.35 & 1.38; base/apex 1.14 & 1.22; sides moderately arcuate anteriorly, nearly straight and converging and usually slightly sinuate posteriorly; otherwise as in *rugifrons*. *Elytra* as in *rugifrons* except apices only more or less rounded-prominent about opposite 3rd intervals, then obliquely subtruncate or slightly emarginate to vaguely or not denticulate sutural angles. *Male copulatory organs* as figured (Fig. 42). *Measurements:* length (types) 14.3–15.6; width (types) 5.1–5.8 mm. (Moss Forest Camp specimens about 18.5 mm. long).

Types. Holotype ♂ (Leiden Mus.) and 9 paratypes (some in M.C.Z., No. 28,629) from Top Camp, Snow Mts., **Neth. N. G.**, 2,100 m. (about 6,825 ft.), Jan. 20–Feb. 8 (holotype Jan. 22), 1939 (Toxopeus).

Other material. Two, referred to in description above, from Moss Forest Camp, Snow Mts., 2,800 m. (about 9,100 ft.), Oct. 9–Nov. 5, 1938 (Toxopeus).

Measured specimens. The ♂ holotype and 1 ♀ paratype.

Notes. Sufficiently characterized in the key to species, above. The Moss Forest specimens may represent a different subspecies or species, but more material is needed to prove it.

LITHAGONUM new genus

Diagnosis. Generally similar to *Notagonum* (of which see description) except in the following characters. Posterior-lateral setae of pronotum absent. Much of upper surface of head and pronotum, elytral striae, and much of lower surface rather closely and more or less coarsely punctate; upper surface without reticulate microsculpture except (in some forms only) at sides and apices of elytra. Male usually with 2 or more (not 1) and ♀ usually with 4 or more (not 2) setae each side last ventral segment.

Description. See that of single species, below.

Genotype. Lithagonum annulicorne dilutior n. subsp., below.

Generic distribution. Much or all of New Guinea in suitable habitats.

Notes. The single species of this genus, with five subspecies, is more fully described below. It is perhaps derived from *Notagonum.* It is somewhat similar superficially to *Notagonum subnigrum* Darl., which it somewhat resembles in habits too, but in my experience *Lithagonum* is even more strictly confined to cobble-stone and similar areas on the banks and bars of rather large streams. Different populations of *Lithagonum* are probably more or less isolated from each other by this habitat restriction, and this may account for the existence of the several distinct subspecies here described.

LITHAGONUM ANNULICORNE (Maindr.)

Colpodes annulicornis Maindron 1908, Nova Guinea **5**, p. 297.
Ibid. 1908, Bull. Soc. Ent. France, p. 185.

Description (species as a whole). Form (Fig. 4) rather *Platynus*-like, but head relatively large, prothorax rather small-cordate, and elytra rather wide and convex; black, appendages brown or piceous; upper surface extensively punctate, but polished between the punctures, without reticulate microsculpture except sometimes at sides and apices of elytra. *Head:* relative widths given under subspecies; eyes rather large and prominent; both pairs of supraocular setae present, posterior ones about between posterior edges of eyes; front normally convex, with rather deep anterior impressions; surface rather closely punctate especially across base and at sides, with middle of front much less or not punctate; antennae rather long and slender, normal in structural details; mentum tooth triangular, more or bless blunted at apex. *Prothorax* narrowly cordate; proportions given under subspecies; sides arcuate anteriorly, strongly sinuate well before right or acute basal angles; lateral margins narrow, with usual anterior-lateral setae about

⅖ from apex but no posterior-lateral ones; basal foveae small, shallow, sometimes more or less linear, rugosely punctate, and areas between and before them also more or less closely punctate; disc with median area less closely or not punctate, with usual median and slight transverse impressions; basal and apical marginal lines poorly defined or absent. *Elytra* rather broad and convex, varying in length in different subspecies; sides subparallel (often slightly arcuate) at middle; humeri broadly rounded; base margined, margin usually slightly angulate at humeri; lateral margins moderate; subapical sinuations moderate, broad, each ending in a prominent angulation, tooth, or short spine about opposite 4th interval, then subtruncate or more or less deeply emarginate to sutural angle; latter usually (not always) more or less denticulate; striae deep, entire except some very slightly abbreviated at base, more or less coarsely punctate; intervals convex, 8th and 9th not much modified toward apex; 3rd interval normally 3-punctate. *Inner wings* fully developed. *Lower surface* with all sterna and base of abdomen closely and more or less coarsely punctate; abdomen variable (slightly to extensively), rather sparsely pubescent; prosternal process simple. *Legs:* hind tibiae not sulcate along outer edges; hind tarsi slender, lightly or not distinctly sulcate each side above; 4th hind-tarsal segment deeply emarginate, with short outer lobe and subequal or slightly shorter inner one; 5th hind-tarsal segment without obvious accessory setae; claws simple. *Secondary sexual characters* normal except ♂ with usually 2, ♀ with usually about 4 setae each side last ventral segment. *Male copulatory organs* as figured (for subsp. *dilutior*, Fig. 43). *Measurements:* see under subspecies.

Types. From "Tana Mera", "Jamur supérieur", and "Moso", **Neth. N. G.**; 4 examples in all, probably now in Paris Mus. I here restrict the type locality to the first one named, commonly spelled Tanahmerah (Bay), on the north coast at the west end of the Cyclops Mts. (Moso is just east of the Tami River, which is not far east of the Cyclops Mts. "Jamur supérieur" is probably far to the west, in the vicinity of Lake Jamur.)

Occurrence in New Guinea. See under subspecies.

Measured specimens. See under subspecies.

Notes. It should be noted that, although the exact form of the elytral apices varies in different subspecies, it varies somewhat also in individuals from single localities. It should not be used as a subspecific character except after examination of series. The habitat of this species has been described under the genus, above.

After the preceding discussion of types was written, I have examined one apparent cotype of *annulicorne*, sent by the Paris Museum. Unfortunately the locality of this specimen is not clear, but it appears to

be "B. Jamoer", and the date of collection is 5.VIII.1903. This may be the cotype originally recorded from "Jamur supérieur". In its characters (elytra with 9th intervals not reticulate and apices with relatively well developed spines opposite 3rd intervals and relatively short sutural denticles) this specimen agrees better with *politior* than with any other form here recognized, but it may well be a different, undescribed subspecies. However this may be, I see no reason now to change the arrangement of subspecies proposed below.

Key to Subspecies of Lithagonum annulicorne (Maindr.)

1. Legs brown; (at least 9th and usually also 8th elytral intervals with distinct reticulate microsculpture); (Papua); (p. 178) ..... *dilutior*
– Legs darker, piceous 2
2. No reticulate microsculpture (or rarely faint traces of it) even on 9th intervals at middle of length; (N-E. N. G.) 3
– At least 9th intervals of elytra (and often also 8th etc.) with distinct reticulate microsculpture; (Neth. N. G.) 4
3. Stouter; apices of elytra with relatively prominent denticles or short spines; (Markham Valley & vic.) (p. 179) ..... *politior*
– More slender; apices of elytra with less prominent denticles; (Bismarck Range) (p. 179) ..... *bismarckense*
4. Stouter; elytral apices with outer denticles more prominent; elytral striae coarsely punctate; (Cyclops Mts. & vic.) (p. 180) ..... *annulicorne s. s.*
– More slender and depressed; elytral apices with outer denticles usually less prominent (but variable); elytral striae more finely punctate; (vic. of Snow Mts.) (p. 180) ..... *baliem*

LITHAGONUM ANNULICORNE DILUTIOR n. subsp.

Description. Form as figured (Fig. 4). Smaller than other subspecies. Legs brown (not blackish). *Head* .90 & .87 width prothorax. *Prothorax:* width/length 1.20 & 1.22; base/apex 1.03 & 1.03. *Elytra* relatively short (in species) and usually a little more oval (with more arcuate sides) than in other subspecies; apices variable, usually comparatively weakly emarginate between denticles, and latter usually comparatively small, with outer ones often no more prominent than sutural ones (but in some individuals outer ones are slightly or much more prominent than sutural ones); striae moderately coarsely punctate; at least 9th, almost always 8th, and sometimes less distinctly 7th etc. intervals with somewhat irregular, somewhat transverse reticulate microsculpture (microsculpture almost lacking on 8th though distinct on 9th intervals in one individual from Kokoda). *Male copulatory organs* as shown in Fig. 43. *Measurements:* length 8.0–9.1; width 3.1–3.5 mm.

Types. Holotype ♂ (M.C.Z. No. 28,630) and 21 paratypes from Dobodura, **Papua**, Mar.–July 1944 (Darlington). Additional paratypes from **Papua** as follows: 4, (near) Oro Bay, Dec. 1943 (Darlington); 31, Kokoda, 1,200 ft., Aug. 1933 (Cheesman). These three localities are within about 40 miles of each other, all on north-flowing drainage systems.

Measured specimens. The ♂ holotype and 1 ♀ paratype from Dobodura.

Lithagonum annulicorne politior n. subsp.

Description. Legs blackish. *Head* .83 & .84 width prothorax. *Prothorax:* width/length 1.18 & 1.17; base/apex 1.06 & .98. *Elytra* relatively short, slightly suboval (with sides slightly, variably arcuate); apices rather strongly emarginate between denticles, and outer denticles usually (not always) much more prominent than sutural ones; striae moderately coarsely punctate; all intervals including 8th and 9th without reticulate microsculpture at least at middle of length (1 specimen from Nadzab has 9th intervals faintly reticulate). *Measurements:* length 9.1–10.2; width 3.4–4.0 mm.

Types. Holotype ♂ (M.C.Z. No. 28,631) and 20 paratypes from Nadzab, lower Markham Valley, **N-E. N. G.**, July 1944 (Darlington); and 4 paratypes from Lae, also in the lower Markham Valley, Oct. 1944 (Darlington).

Other material. Eighteen, Morobe Dist., **N-E. N. G.** (some specifically from Surprise Creek, Sept. 28 & Oct. 7) (Stevens, M.C.Z.) The Morobe Dist. is not far south of the Markham Valley.

Measured specimens. The ♂ holotype and 1 ♀ paratype from Nadzab.

Lithagonum annulicorne bismarckense n. subsp.

Description. Legs blackish. *Head* .90 & .86 width prothorax. *Prothorax:* width/length 1.20 & 1.18; base/apex 1.01 & 1.02. *Elytra* slightly more elongate, less oval, and less convex than in preceding (*politior*); apices comparatively weakly emarginate between denticles, and latter less prominent than in *politior*; striae comparatively less coarsely punctate; all intervals including 8th and 9th without reticulate microsculpture at least at middle of length (except 9th intervals faintly reticulate in 1 specimen). *Measurements:* length 9.3–10.1; width 3.5–3.8 mm.

Types. Holotype ♂ (M.C.Z. No. 28,632) and 7 paratypes from

Chimbu Valley, Bismarck Range, **N-E. N. G.**, 5,000–7,500 ft. (probably all actually from near 5,000 ft.), Oct. 1944 (Darlington).

Measured specimens. The ♂ holotype and 1 ♀ paratype.

Lithagonum annulicorne annulicorne (Maindr.)

For references, see species as a whole, above.

Description. Legs blackish. *Head* .86 & .87 width prothorax. *Prothorax:* width/length 1.20 & 1.17; base/apex 1.00 & 1.01. *Elytra* relatively short, convex, subquadrate (with sides at most very slightly arcuate at middle); apices rather deeply emarginate between denticles; outer denticles large, almost short spines, much more prominent than sutural denticles; striae coarsely punctate; 9th and (much less distinctly) 8th intervals with reticulate microsculpture. *Measurements:* length 9.6–9.8; width about 3.7 mm.

Types. As indicated under species as a whole, where type locality is restricted to "Tana Mera" (Tanahmerah Bay), at western end of Cyclops Mts., **Neth. N. G.**

Occurrence in New Guinea. I have seen only 3 ♀♀ referable to typical *annulicorne*, all taken not far from the type locality, at Sabron, Cyclops Mts., 930 ft., Apr. 1936 (Cheesman).

Measured specimens. Two of the 3 ♀♀ recorded above.

Notes. The present description covers only the subspecific characters of typical *annulicorne*. The species as a whole is more fully described above.

Lithagonum annulicorne baliem n. subsp.

Description. Legs blackish. *Head* .90 & .94 width prothorax. *Prothorax:* width/length 1.29 & 1.23; base/apex 1.01 & .98. *Elytra* relatively longer than in typical *annulicorne* and less convex; apices usually less emarginate between denticles, and outer denticles smaller and less prominent than in *annulicorne s. s.*; striae less coarsely punctate than in other subspecies; reticulate microsculpture always distinct on 9th, usually so on 8th, and often faintly visible on discal intervals too. *Measurements:* length 9.3–10.0; width about 3.3–3.7 mm.

Types. Holotype ♂ (Leiden Mus.) and 12 paratypes (some in M.C.Z., No. 28,633) all from Baliem Camp, Snow Mts., **Neth. N. G.**, 1,700 m. (about 5,525 ft.), Nov. 16–27, 1938 (Toxopeus).

Measured specimens. The ♂ holotype and 1 ♀ paratype.

IRIDAGONUM new genus

Diagnosis. Small or medium sized (8.2–13.4 mm.); *Agonum*-like or rarely fusiform; wing-and-seta formula +w, (+)+, −+, (+)++; elytra always strongly iridescent, characteristically toothed at sutural angles but not otherwise armed, usually with 7th and 8th intervals longitudinally impressed toward apex (not so in *quadripunctellum*); sides of body below always more or less strongly punctate.

Description. *Agonum*-like or fusiform; color including that of appendages always dark; upper surface always strongly iridescent especially on elytra, impunctate except sometimes punctate in basal foveae of pronotum; microsculpture light or very fine, not distinguishable at 54X except sometimes on front of head. *Head* only moderately elongate; eyes moderate in size, varying in prominence; both pairs supraocular setae present except anterior pair absent in *subfusum;* posterior pair between or behind line of posterior edges of eyes; antennae of average or less than average length, normally formed; frontal impressions slight; mentum tooth triangular, more or less blunted at tip. *Prothorax* with anterior-lateral setae always absent, posterior-lateral ones always present; otherwise differing in details in different species. *Elytra* margined at base, the margin always strongly (obtusely to about rectangularly) angulate at humeri; subapical sinuations always slight or absent; sutural angles always with denticles or short spines but apices not otherwise armed; striae normal; 7th and 8th intervals and sometimes others at least toward apex deeply longitudinally impressed and so appearing doubled (except not so in *quadripunctellum*). *Inner wings* fully developed. *Lower surface* with sides of sterna extensively and more or less closely but irregularly punctate; abdomen not pubescent; prosternal process normal. *Legs* normally formed, as in *Notagonum*, but 4th hind-tarsal segment always simply emarginate, not distinctly lobed, and 5th hind-tarsal segment always with fine, short, but distinct accessory setae; claws simple. *Secondary sexual characters* normal. *Male copulatory organs* as figured (Figs. 44 & 45).

Genotype. Iridagonum quadripunctum n. sp. (below).

Generic distribution. Widely distributed in New Guinea; as yet unknown elsewhere.

Notes. The species of this new genus form a natural group apparently endemic to New Guinea, perhaps derived from *Notagonum.* Two of the species (*quadripunctum* and *sexpunctum*) are unusually variable in form and proportions, but after careful study I can distinguish no more than the four species keyed out below. I have taken only one species (*quadripunctum*) of this genus in its natural habitat, among

dead leaves on the ground in heavy rainforest. This is probably the habitat of the other species too. The types of *quadripunctellum* were found in flood-debris in forested or formerly forested country. Most of the specimens of *quadripunctum* and *sexpunctum* collected by Cheesman and Toxopeus were apparently caught in light traps, for the specimens are liberally sprinkled with scales of Lepidoptera.

Key to the Species of Iridagonum

1. Third interval of elytron 2-punctate (anterior puncture missing); (form rather *Agonum*-like) 2
– Third interval 3-punctate 3
2. Larger (9.3–13.4 mm.); elytral intervals 7 & 8 deeply longitudinally impressed at least toward apex (p. 182) ..... *quadripunctum*
– Smaller (8.2–9.0 mm.); elytral intervals not or only slightly impressed (p. 183) ..... *quadripunctellum*
3. Form *Agonum*-like; both pairs of supraocular setae present (p. 184) ..... *sexpunctum*
– Form fusiform; anterior supraocular setae missing (and eyes smaller and more abrupt than usual) (p. 185) ..... *subfusum*

Iridagonum quadripunctum n. sp.

Description. With characters of genus as described above. Form of broad *Agonum s. s.* (Fig. 5). *Head* .67, .67, & .69 width prothorax; eyes normally formed, of moderate size and prominence; both pairs supraocular setae present, posterior ones about between posterior edges of eyes. *Prothorax* moderately narrowed behind and somewhat more so in front; width/length 1.40, 1.33, & 1.36; base/apex 1.28, 1.25, & 1.26; anterior angles only moderately prominent; sides rather broadly arcuate anteriorly, nearly straight (or slightly arcuate or slightly sinuate in some individuals) and moderately converging posteriorly; posterior angles obtuse, narrowly rounded; lateral margins moderate, wider posteriorly, not sharply defined, only moderately reflexed; basal foveae rather broad and shallow, variably (usually rather closely) punctate; disc with median line moderately impressed, transverse impressions slight, anterior marginal line light and variable, posterior one still lighter, often absent. *Elytra* rather short and broad, somewhat variable in form, slightly and variably impressed before middle; basal margin strongly but obtusely angulate or subangulate at humeri; striae moderately impressed, faintly or not punctulate; 7th interval apically, 8th for much of length, (and 9th somewhat variably) longitudinally impressed; 3rd interval 2-punctate (anterior puncture missing); sutural angles with short, slightly out-curving spines in

large individuals but with only strong denticles in smaller individuals. *Male copulatory organs* as figured (Fig. 44). *Measurements:* length 9.3–13.4; width 3.8–5.0 mm.

Types. Holotype large ♂ (M.C.Z. No. 28,634) and 10 paratypes (including entire size-range of species) from Dobodura, **Papua,** Mar.–July 1944 (Darlington). Also the following additional paratypes: **Papua:** 1, Kokoda, 1,200 ft., Aug. 1933 (Cheesman); 1, Mafulu, 4,000 ft., Dec. 1933 (Cheesman); 2, Palmer River at Black River, June 7–14 & 15–22, 1936 (Archbold Exp., American Mus.). **N-E. N. G.:** 1, Sattelberg (British Mus.); 3, Aitape, Aug. 1944 (Darlington). **Neth. N. G.:** 1, Dorey ("Dory") (Vogelkop) (British Mus.); 1, mountain slope above Bernhard Camp, Snow Mts., 100 m. (about 325 ft.), Apr. 1939 (Toxopeus); 1, Rattan Camp, Snow Mts., 1,150 m. (about 3,750 ft.), Feb.–Mar. 1939 (Toxopeus).

Other material. Four, Waigeo Is., **Neth. N. G.**, (Mt. Nok, 2,500 ft., May 1938, Cheesman).

Measured specimens. Large ♂ holotype and large ♀ and small ♀ paratypes from Dobodura.

Notes. Although this is in some ways an excessively variable species, the characters used to define it in the key (above) appear to hold without exception.

Iridagonum quadripunctellum n. sp.

Description. With characters of genus as described above, except outer elytral intervals not or only slightly impressed. Form of average *Agonum s. s. Head* .68 & .68 width prothorax; eyes normally formed, moderately large and prominent; both pairs of supraocular setae present, posterior ones about between posterior edges of eyes. *Prothorax* moderately narrowed in front and behind; width/length 1.32 & 1.32; base/apex 1.24 & 1.22; anterior angles only normally prominent; sides broadly arcuate, straighter (converging) and usually slightly sinuate toward base; basal angles obtuse, almost rounded-out; lateral margins moderate, broader toward base, only slightly reflexed; basal foveae broad, shallow, not sharply defined, punctate, the punctation extending (more sparsely) onto sides of pronotum before foveae; disc about as in *quadripunctum. Elytra* of average width and convexity, not impressed on disc; basal margin distinctly but obtusely angulate at humeri; apical-sutural denticles small but distinct; striae moderately impressed, faintly or not punctulate; 8th interval usually vaguely impressed in part only, 7th usually not impressed; 3rd interval 2-punctate (anterior puncture missing). *Measurements:* length 8.2–9.0; width 3.0–3.5 mm.

Types. Holotype ♂ (M.C.Z. No. 28,635) and 7 paratypes all from Aitape, **N-E. N. G.**, Aug. 1944 (Darlington).

Measured specimens. The ♂ holotype and 1 ♀ paratype.

Notes. Sufficiently defined in the key, above.

Iridagonum sexpunctum n. sp.

Description. With characters of genus as described above. Form of *Agonum s. s.* (more slender than *quadripunctum*), but somewhat variable. *Head* .61, .62, & .65 width prothorax; eyes normally formed, only moderately large and prominent; both pairs supraocular setae present, posterior ones about between posterior edges of eyes. *Prothorax* longer than in *quadripunctum*, rather strongly narrowed in front, less so behind; width/length 1.27, 1.30, 1.18; base/apex 1.40, 1.41, & 1.30; anterior angles more prominent than in *quadripunctum* (so that prothorax seems longer than figures suggest), acute but with apices narrowly rounded; sides broadly (variably) arcuate for much of length, more or less straight and slightly converging and often slightly and broadly sinuate before base; basal angles somewhat obtuse but well defined, only a little blunted; lateral margins moderate, not sharply defined, wider and a little more reflexed toward base; basal foveae shallow, more or less lightly punctate; disc as in *quadripunctum*. *Elytra* relatively long (in genus), with sides nearly parallel at middle; disc usually very slightly impressed about ⅓ from base; basal margin strongly, about rectangularly angulate at humeri; denticles at sutural angles smaller than in *quadripunctum*; striae lightly impressed, not or only faintly punctulate; outer elytral intervals longitudinally impressed about as in *quadripunctum*; 3rd interval 3-punctate, the punctures about normally placed. *Measurements:* length 10.2–12.2; width 3.6–4.4 mm.

Types. Holotype ♂ (British Mus.) and 10 paratypes (some in M.C.Z. No. 28,636) from Mt. Cyclops, Cyclops Mts., **Neth. N. G.**, 3,500 ft., Mar. 1936 (Cheesman). Also the following additional paratypes from **Neth. N. G.**: 6, Mt. Lina, Cyclops Mts., 3,500–4,500 ft., Mar. 1936 (Cheesman); 1, simply Cyclops Mts., 3,400–4,500 ft., Mar. 1936 (Cheesman); 1, Araucaria Camp, Snow Mts., 800 m. (about 2,600 ft.), Mar. 1939 (Toxopeus); 6, Rattan Camp, Snow Mts., 1,150 & 1,200 m. (about 3,750 & 3,900 ft.), Feb.–Mar. 1939 (Toxopeus); 1, Sigi Camp, Snow Mts., 1,500 m. (about 4,875 ft.), Feb. 24, 1939 (Toxopeus); 1, Mist Camp, Snow Mts., 1,800 m. (about 5,850 ft.), Jan. 1939 (Toxopeus).

Other material. One ♀, Chimbu Valley, Bismarck Range, **N-E. N. G.**, 5,000–7,500 ft., Oct. 1944 (Darlington). This probably repre-

sents at least a distinct subspecies, but I do not care to describe it without more material because of the great individual variation of some species of this genus.

Measured specimens. A large ♂, large ♀, and smaller and narrower ♂, all from the Cyclops Mts.

Notes. This variable species seems to be constant in at least the characters given in the key to species, above.

Iridagonum subfusum n. sp.

Description. With characters of genus as described above. Broadly subfusiform, more attenuate in front than behind. *Head* .63 width prothorax; eyes a little smaller but more abruptly prominent than usual; anterior supraocular setae absent, posterior ones somewhat behind line of posterior edges of eyes. *Prothorax* strongly narrowed in front, only slightly so behind; width/length 1.21; base/apex 1.47; anterior angles prominent and acute except slightly rounded at tips; sides slightly arcuate at middle, nearly straight anteriorly and posteriorly, slightly sinuate near base; basal angles somewhat obtuse but well defined, only slightly blunted; lateral margins as usual in genus; basal foveae slightly deeper than usual, only vaguely punctate; disc as in other species; anterior marginal line almost entire, posterior one absent. *Elytra* rather wide, more convex than usual, scarcely impressed before middle; basal margin about rectangular at humeri; sutural angles with rudimentary denticles; striae deeply impressed, not punctate; outer intervals more lightly and briefly longitudinally impressed than in *quadripunctum* and *sexpunctum*; 3rd interval 3-punctate. *Male copulatory organs:* Fig. 45. *Measurements:* length 12.4; width about 5.0 mm.

Type. Holotype ♂ (Leiden Mus.) from Ibele (Iebele) Camp, Snow Mts., **Neth. N. G.**, 2,250 m. (about 7,325 ft.), Nov.–Dec. 1938 (Toxopeus); unique.

Measured specimen. The type.

Notes. In form, modification of eyes, and loss of anterior supraocular setae this interesting species parallels certain *Fortagonum* (*bufo* etc.) (see below) which also occur at high altitudes on the Snow Mts., but there is probably no direct relationship.

Altagonum new genus

Diagnosis. Small or medium-sized (5.3–13.7 mm.); very variable in form, often *Agonum*- or *Calathus*-like, sometimes *Europhilus*- or *Sphodrus*-like or fusiform; variable also in color, usually black or

brown, rarely with elytra green (*cheesmani*) or purplish (*regiscapha*), elytra sometimes broadly margined with pale but never mottled or blotched, sometimes (but not usually) more or less iridescent; wing-and-seta formula +w, ++, − (+), (+) (+) (+); see also key to genera.

Description. Size, form, and color as described above; upper surface usually impunctate (sometimes punctate in basal foveae of pronotum); microsculpture variable. *Head* more variable in form than in *Notagonum*, often a little more elongate; eyes variable, usually at least moderately large and prominent, but sometimes reduced in size or prominence; both pairs supraocular setae always present, posterior pair usually about between posterior edges of eyes, but relatively farther back when eyes reduced; head otherwise about as in *Notagonum*. *Prothorax* variable in form; anterior-lateral setae always absent, posterior-lateral ones usually present but absent in *nudicolle* and *fatuum*; prothorax otherwise essentially as in *Notagonum*; further details as described for species below. *Elytra* variable in form; basal margin entire, rounded or variably angulate at humeri; apices variable; striae normal; intervals usually not much modified toward apex, but outer ones sometimes (*pallinox, sphodrum*, etc.) longitudinally sulcate at least apically; 3rd interval usually normally 3-punctate, sometimes 2-punctate with anterior puncture absent, rarely impunctate (*fatuum* only). *Inner wings* always fully developed. *Lower surface* usually impunctate or nearly so; abdomen usually not pubescent, but with moderate or extensive pubescence in a few cases (*pubinox, pallinox, noctellum*, & *planinox; sphodrum* & *postsulcatum*); prosternal process simple. *Legs* including tarsi as in *Notagonum*, but 4th hind-tarsal segment usually simply emarginate, and if lobed (*caducum, cheesmani, scapha, nudicolle*) lobes very short, but with outer lobe still usually slightly longer than inner one; 5th hind-tarsal segment without obvious accessory setae but always or almost always with minute, very inconspicuous, perhaps vestigial ones (as in at least some *Notagonum*); claws simple. *Secondary sexual characters* normal. *Male copulatory organs* as figured (Figs. 46–51).

Genotype. Altagonum caducum n. sp. (below).

Generic distribution. Numerous in New Guinea, chiefly in the mountains; further range not determined.

Notes. Like *Notagonum*, this is a genus of convenience, distinguished from *Notagonum* by only one constant detail, absence of the anterior-lateral pronotal setae. This character is not of itself of generic value, and the group which it defines is, as I have indicated, not entirely a natural one. However its recognition is useful. The group is a transitional one which bridges the gap between the more generalized low-

land Agonini of New Guinea, especially *Notagonum*, and several well-marked groups of mountain species, here called genera, characterized by further loss of setae, loss of wings, and in other ways. *Altagonum* is intermediate in altitudinal distribution as well as in structure. The majority of *Notagonum* occur at low altitudes, although there are also some which occur high in the mountains. But of *Altagonum* only one species (*vallicola*) seems to occur regularly at lowest altitudes and only one other (*grossulum*) was found even rarely at Dobodura. Most species of the genus are chiefly or entirely confined to middle and high altitudes. Their structure is correlated with their distribution. In several ways (loss of setae, modification of eyes in some cases, partial or complete loss of well-developed lobes of the 4th hind-tarsal segments) they show the beginnings of the effect of the mountain environment on what were obviously originally normal Agonini. These same changes, and eventually also loss of wings and other changes, have occurred among mountain Carabidae, especially Agonini, in many other parts of the world, as I have mentioned in the introduction to the present paper. The few species of *Altagonum* that I have myself collected in sufficient numbers to be sure of their habitats (*vallicola*, *sphodrum*, *nudicolle*) all occur on the ground in heavy forest, and are not associated with running or standing water. This is probably the habitat of most species of the genus, although some may depart from it.

One species evidently referable to this genus has been previously described, but I do not recognize it in the material before me. It is

Altagonum papuense (Sl.)

Platynus papuensis Sloane 1890, Records Australian Mus. **1**, p. 103.
Colpodes papuensis Sloane 1907, Deutsche Ent. Zeits., p. 179.

Type. From St. Joseph's River District, on the south coast of Papua about opposite Yule Is.; probably in the Australian Mus. at Sydney, Australia.

Occurrence in New Guinea. Known only from the type.

Notes. This is a rather large (9 by 3½ mm.), black, *Agonum*-like form, with 3rd elytral interval 2-punctate (anterior puncture absent). It may be a form of the species here called *vallicola*, but if so it is probably not identical with any of the subspecies here described: it is larger than typical *vallicola*, probably broader than subspecies *huonis*, and apparently without the iridescence of subspecies *subvividum*. Its locality (the south coast of New Guinea) is consistent with its being a fourth subspecies of the group. But Sloane, in his careful description of *papuense*, mentions no angulations of the elytral apices, which

suggests that he had before him a distinct species which I have not seen. There is no use in guessing further about this now. For the present it seems better not to assign the name at all than to risk assigning it wrongly. The species is not included in the following key.

Key to the Species of Altagonum of New Guinea

1. Posterior-lateral pronotal setae present....2
— Posterior-lateral pronotal setae absent....23
2. Plain black or brown, *Agonum*-like forms, not fusiform; prothorax normally formed, at least moderately narrowed behind, with posterior angles obtuse or rounded....3
— Not as above in one or more details....14
3. Third elytral interval 2-punctate (anterior puncture absent)....4
— Third elytral interval 3-punctate....6
4. Black, lateral margins of prothorax and elytra not much paler, legs dark; elytral apices strongly angulate....*vallicola*
   (4a) Smaller (6.8–7.9 mm.); not distinctly iridescent (p. 190)....(*vallicola* s. s.)
   (4b) Larger (8.3–9.0 mm.); more slender; faintly iridescent (p. 190)....(subsp. *huonis*)
   (4c) Still larger (9.1–9.7 mm.); broad as typical form; more strongly iridescent (p. 191)....(subsp. *subvividum*)
— Brownish-black, lateral margins of prothorax and elytra yellowish-translucent, legs yellowish-brown; elytral apices not angulate....5
5. Broader, prothoracic width/length 1.47–1.54; length 5.3–6.7 mm....*grossulum*
   (5a) Reticulate microsculpture (at 54×) faint or almost absent on disc of pronotum, distinct and moderately transverse on elytra; latter not iridescent (p. 191)....(*grossulum* s. s.)
   (5b) Microsculpture distinct on pronotum, indistinguishable (at 54×) on elytra; latter not distinctly iridescent (p. 193)....(subsp. *reticolle*)
   (5c) Microsculpture of pronotum light and variable, of elytra indistinct (at 54×); elytra and sometimes also pronotum iridescent (p. 193)....(subsp. *intensum*)
— Narrower, prothoracic width/length 1.31–1.40; length 6.4–7.5 mm. (p. 194)....*grossuloides*
6. Basal margin of elytra obtusely angulate at humeri; length 6.5–10.6 mm. (if less than 9.0 mm., abdomen pubescent)....7
— Basal margin of elytra rectangular or nearly so at humeri (points of angles sometimes slightly blunted); length 6.6–7.9 mm. (abdomen not pubescent)....13
7. Abdomen not pubescent; length 9.0–10.6 mm....8
— Abdomen pubescent at least near middle basally; length 6.5–9.0 mm....10
8. Length 9.0–9.5 mm. (p. 194)....*nox*
— Larger, relatively a little broader; (see also descriptions)....9
9. Lateral margins of prothorax not obviously pale (p. 195)....*magnox*

— Lateral margins of prothorax yellowish-translucent; (see also description) (p. 196) ..... *japenox*
10. Length 8.1–9.0 mm. (p. 196) ..... *pubinox*
— Size smaller; (see also descriptions) 11
11. Outer elytral intervals longitudinally impressed at least toward apex (p. 200) ..... *pallinox*
— Outer elytral intervals not longitudinally impressed 12
12. Basal foveae of pronotum moderately impressed (p. 197) ..... *noctellum*
— Basal foveae of pronotum scarcely impressed, flat (p. 198) ..... *planinox*
13. Broad *Agonum*-like; prothoracic width/length 1.29–1.34 (p. 198) .. *dilutipes*
— More slender *Europhilus*-like; prothoracic width/length 1.15 & 1.18 (p. 199) ..... *europhilum*
14. Elytra not broadly margined with pale 15
— Elytra broadly margined with pale 22
15. Apex of each elytron drawn out into a single, short, acute spine nearly in line of sutural interval, the spines slightly dehiscent; (see also description (p. 201) ..... *tutum*
— Elytra with apices simple, or armed differently from above 16
16. Not strikingly fusiform; elytra not metallic 17
— Fusiform; elytra sometimes (not always) green or purplish 20
17. Outer elytral intervals not much modified toward apex (p. 202) .. *caducum*
— Elytral intervals 7, 8, & 9 longitudinally impressed at least toward apex. 18
18. Prothorax subquadrate, relatively narrow, width/length 1.18 & 1.20 in measured specimens; base/apex 1.28 & 1.20; (abdomen pubescent) (p. 204) ..... *sphodrum*
— Prothorax wider, more narrowed in front, width/length 1.30–1.44, base/apex 1.40–1.47 19
19. Apices of elytra unarmed or with at most small sutural denticles; abdomen pubescent at least near middle basally (p. 205) ..... *postsulcatum*
— Apex of each elytron with 2 prominent denticles; abdomen not pubescent (p. 206) ..... *misim*
20. Elytra green, (spined); eyes very prominent, head .80 width prothorax (p. 207) ..... *cheesmani*
— Elytra black or purplish, (spined or angulate at apices); eyes less prominent, head .65 or less width prothorax 21
21. Elytra black; posterior-lateral pronotal setae on flat surface of margins well in from edges (p. 208) ..... *scapha*
— Elytra purplish; posterior-lateral pronotal setae on edges of margins (p. 209) ..... *regiscapha*
22. Broader; prothoracic width/length 1.48 & 1.44 in measured specimens; dark discal color of elytra not extending in a narrow sutural stripe toward apex (p. 210) ..... *latilimbus*
— More slender; prothoracic width/length 1.32 & 1.34; dark discal color of elytra extending along sutural intervals toward (not to) apex (p. 211) *paralimbus*
23. Form rather broad *Calathus*-like; 3rd elytral interval 3-punctate (p. 211) *nudicolle*
— Form slender; 3rd elytral interval impunctate (p. 212) ..... *fatuum*

Altagonum vallicola n. sp.

Description. With characters of genus as described above. Form of broad *Agonum s. s.*; black, appendages brownish-black, lateral margins of prothorax and elytra only slightly translucent; upper surface impunctate except vaguely punctate in basal foveae and on lateral margins of pronotum, moderately shining, not distinctly iridescent; microsculpture lightly impressed, normal (isodiametric on head, transverse on pronotum, more transverse on elytra). *Head* .61 & .66 width prothorax; eyes large and prominent, with posterior supraocular setae about between their posterior edges. *Prothorax* large and wide; width/length 1.55 & 1.44; base/apex 1.43 & 1.42; sides strongly arcuate for most of length, nearly straight and converging and sometimes slightly sinuate before basal angles; latter obtuse, moderately rounded; lateral margins rather wide, wider and more reflexed toward base; basal foveae normal, vaguely punctate; disc normal; anterior and posterior marginal lines entire or nearly so. *Elytra* moderately wide, normal in outline and convexity, not or faintly impressed before middle; basal margin usually vaguely subangulate at humeri; lateral margins rather wide; subapical sinuations moderate; apices prominently angulate about opposite 3rd intervals, these angulations more prominent than sutural ones; apices then obliquely subtruncate to finely denticulate sutural angles; striae variably, usually rather lightly impressed, not or faintly punctulate; intervals nearly flat or slightly convex, 8th and 9th not much modified toward apex; 3rd interval 2-punctate (anterior puncture absent). *Lower surface* virtually impunctate; abdomen not pubescent. *Legs:* 4th hind-tarsal segment emarginate, not lobed. *Male copulatory organs:* Fig. 46. *Measurements:* length 6.8–7.9; width 2.8–3.1 mm.

Types. Holotype ♂ (M.C.Z. No. 28,637) and 25 paratypes all from Dobodura, **Papua**, Mar.–July 1944 (Darlington); taken among dead leaves on the ground in heavy rainforest in company with superficially similar *Notagonum spinulum.*

Measured specimens. The ♂ holotype and 1 ♀ paratype.

Notes. Sufficiently discussed and defined under the genus and in the key to species, above. Perhaps it should be added that small specimens of this species are extremely similar to *Notagonum subspinulum* except that they lack the anterior-lateral pronotal setae and have the elytral apices armed with only acute teeth rather than short spines.

Altagonum vallicola huonis n. subsp.

Description. Similar to typical *vallicola* in all details except a little larger, obviously more elongate, and with faint iridescence on elytra

in strong light. *Head* .67 & .69 width prothorax. *Prothorax:* width/length 1.39 & 1.39; base/apex 1.46 & 1.47; sides less strongly rounded than in typical *vallicola*, and basal angles correspondingly more distinct, though still obtusely rounded. *Elytra* more slender and elongate, with basal margin a little more distinctly angulate at humeri. *Measurements:* length 8.3–9.0; width 3.1–3.4 mm.

Types. Holotype ♂ (M.C.Z. No. 28,638) from (hills north of) Nadzab, **N-E. N. G.**, July 1944 (Darlington); and 1 ♂ paratype from Sattelberg, **N-E. N. G.** (British Mus., ex Coll. G. Hauser).

Measured specimens. The types.

Notes. Sufficiently compared with typical *vallicola* above.

Altagonum vallicola subvividum n. subsp.

Description. Similar to typical *vallicola* in all details except larger, with elytra a little more distinctly (but variably) impressed before middle, a little more deeply striate, and more or less strongly iridescent. *Head* .63 & .64 width prothorax. *Prothorax:* width/length 1.41 & 1.42; base/apex 1.46 & 1.55; sides rather strongly rounded. *Elytra* less elongate than in *huonis*, a little more deeply striate than usual in typical *vallicola* or *huonis*, and rather strongly iridescent, with elytral microsculpture not distinguishable at 54× and probably too fine and transverse to see. *Measurements:* length (types) 9.1–9.7; width (types) 3.4–3.7 mm.

Types. Holotype ♂ (British Mus.) and 4 paratypes (2 in M.C.Z. No. 28,639) all from Mt. Baduri, Japen Is., **Neth. N. G.**, 1,000 ft., Aug. 1938 (Cheesman).

Other material. All from **Neth. N. G.**, as follows: 1, Hollandia, July–Sept. 1944 (Darlington); 4, Mt. Sabron, Cyclops Mts., 2,000 ft., June & July 1936 (Cheesman); 2, Rattan Camp, Snow Mts., 1,150 & 1,200 m. (about 3,750 & 3,900 ft.), Feb.–Mar. 1939 (Toxopeus); and 1, "New Guinea" (H. E. Andrewes Coll., British Mus., labeled "*Colpodes sp.*"). These specimens, though referable to this subspecies, are a little smaller and/or less strongly iridescent than the types.

Measured specimens. The ♂ holotype and 1 ♀ paratype.

Notes. Sufficiently compared with typical *vallicola* and subspecies *huonis* above.

Altagonum grossulum n. sp.

Description. With characters of genus as described above. Form of small but very broad *Agonum s. s.*; brownish-black, appendages yellowish-brown, lateral margins of prothorax and elytra yellowish-

translucent; upper surface virtually impunctate, moderately shining, not iridescent; microsculpture distinct and isodiametric on head, almost absent or faint on disc of pronotum, distinct and moderately transverse on elytra. *Head* .61 & .63 width prothorax; eyes large and prominent, with posterior supraocular setae slightly before line of their posterior edges. *Prothorax* relatively large and wide; width/length 1.54 & 1.50; base/apex 1.31 & 1.43; sides nearly evenly, rather strongly arcuate for entire or nearly entire length; basal angles obtuse, moderately rounded; lateral margins rather wide, but not much more reflexed toward base; basal foveae rather broad and shallow, vaguely or not distinctly punctate; disc normal, with anterior marginal line entire, posterior one more or less entire but sometimes vague at middle. *Elytra* broad, otherwise of normal outline and convexity, distinctly impressed before middle; basal margin obtusely angulate or blunted at humeri; lateral margins rather wide (in genus); subapical sinuations moderate or slight; apices nearly simple, somewhat irregularly rounded, with sutural angles not or sometimes vaguely denticulate; striae well impressed, impunctate; intervals more or less convex, 8th and 9th not much modified toward apex, 3rd 2-punctate (anterior puncture absent). *Lower surface* virtually impunctate; abdomen not pubescent. *Legs:* 4th hind-tarsal segment simply emarginate, not lobed. *Measurements:* length 5.4–6.5; width 2.3–2.8 mm.

Types. Holotype ♂ (M.C.Z. No. 28,640) and 2 ♂♂ paratypes from Dobodura, **Papua**, Mar.–July 1944 (Darlington); and additional paratypes as follows: **Papua:** 1, Kokoda, 1,200 ft., Aug. 1933 (Cheesman); 2, Mafulu, 4,000 ft., Dec. 1933 & Jan. 1934 (Cheesman). **N-E. N. G.:** 1, Nadzab ("E. fork Ngafir Cr. 1,000–3,000 ft. native trail"), July 13, 1944 (K. V. Krombein, U.S.N.M.).

Other material. Two additional subspecies described below; and 1 specimen from Mt. Nok, Waigeo Is., **Neth. N. G.**, 2,500 ft., May 1938 (Cheesman), which does not fit into any of the subspecies here recognized.

Measured specimens. The ♂ holotype and 1 ♂ paratype from Dobodura.

Notes. This species is distinguished from all related forms known to me by its small size and relatively broad but still *Agonum*-like form, plus details given in the key to species. The present, typical subspecies is distinguished from the others described below by having the disc of the pronotum more shining, without or with only faint traces of reticulate microsculpture, and the elytra with comparatively coarse and obvious microsculpture (most obvious in the Kokoda and Dobodura specimens, finer but still visible in the Mafulu and Nadzab ones) and no or only very slight iridescence. I do not know the ecological habitat

of this species. Although it does occur, rarely, near sea level at Dobodura, it (as represented by the following subspecies) seems to be much commoner in foothills and lower mountains.

Altagonum grossulum reticolle n. subsp.

Description. Size, form, and structural details almost as in typical *grossulum*, but microsculpture of upper surface different, as follows: on head, about same; on disc of pronotum, meshes distinct though somewhat variably so, moderately transverse (not faint or absent as in typical *grossulum*); on elytra, so fine as not to be visible at 54× (not distinct as in typical *grossulum*), but in spite of fineness of microsculpture of elytra, latter not or only faintly iridescent even in strong light. *Head* .65 & .63 width prothorax. *Prothorax:* width/length 1.51 & 1.51; base/apex 1.32 & 1.38. *Measurements:* length 5.7–6.7; width 2.4–2.8 mm.

Types. Holotype ♂ (British Mus.) and 4 paratypes (2 in M.C.Z. No. 28,641) from Sabron, Cyclops Mts., **Neth. N. G.**, 2,000 ft., June & July 1936 (Cheesman); 2 paratypes from Mt. Lina, Cyclops Mts., 3,500–4,500 ft., Mar. 1936 (Cheesman).

Measured specimens. The ♂ holotype and 1 ♀ paratype from Sabron.

Notes. Sufficiently compared with typical *grossulum* above.

Altagonum grossulum intensum n. subsp.

Description. Size, form, and structural details almost as in typical *grossulum* and subspecies *reticolle*, but pronotum sometimes and elytra always rather strongly iridescent; microsculpture of head as in preceding forms, of prothorax light and variable, of elytra not distinctly visible at 54× but probably very fine and transverse. *Head* .66 & .62 width prothorax. *Prothorax:* width/length 1.48 & 1.51; base/apex 1.41 & 1.47. *Measurements:* length 5.3–6.7; width 2.3–2.9 mm.

Types. Holotype ♂ (British Mus.) and 18 paratypes (some in M.C.Z. No. 28,642) from Mt. Baduri, Japen Is., **Neth. N. G.**, 1,000 ft., Aug. 1938 (Cheesman).

Other material. Nine, Rattan Camp, Snow Mts., **Neth. N. G.**, 1,150 m. (about 3,750 ft.), Feb.–Mar. 1939 (Toxopeus); and 1, Lower Mist Camp, Snow Mts., 1,700 m. (about 5,525 ft.), Jan. 17, 1939 (Toxopeus). These specimens average a little larger and somewhat less strongly iridescent than the types.

Measured specimens. The ♂ holotype and 1 ♀ paratype.

Notes. Sufficiently compared with other subspecies above and in the key to species of *Altagonum*.

Altagonum grossuloides n. sp.

Description. Extremely similar to *A. grossulum*, and answering to the description of the latter (see above) in every detail not mentioned below, but more slender, with prothorax especially narrower. *Head* .67 & .64 width prothorax. *Prothorax:* width/length 1.31 & 1.39 (5 other specimens 1.34 to 1.40); base/apex 1.50 & 1.48; sides much more weakly arcuate than in *grossulum* and a little more narrowly margined. *Elytra* as in *grossulum*. *Measurements:* 6.4–7.5; width 2.6–3.0 mm.

Types. Holotype ♂ (Leiden Mus.) and 8 paratypes (some in M.C.Z. No. 28,643) from Mist Camp, Snow Mts., **Neth. N. G.**, 1,800 m. (about 5,850 ft.), Jan. (1 paratype Feb. 3) 1939 (Toxopeus). Also the following paratypes, all from **Neth. N. G.:** 3, Rattan Camp, Snow Mts., 1,150 m. (about 3,750 ft.), Feb.–Mar. 1939 (Toxopeus); 3, Top Camp, Snow Mts., 2,100 m. (about 6,825 ft.), Jan. 27, 1939 (Toxopeus); 4, Mt. Lina, Cyclops Mts., 3,500–4,500 ft. (2 specifically from 4,500), Mar. 1936 (Cheesman); 1, Cyclops Mts. without more exact locality, 3,400–4,500 ft., Mar. 1936 (Cheesman); and 2, Mt. Baduri, Japen Is., 1,000 ft., Aug. 1938 (Cheesman).

Measured specimens. The ♂ holotype and 1 ♀ paratype from Mist Camp.

Notes. If this were geographically separated from *grossulum*, I might consider it merely a subspecies of the latter, but since the two occur in the same areas they are presumably distinct species. There is no overlapping of prothoracic ratios: width/length of prothorax in 9 measured specimens of *grossulum* (including all subspecies) is 1.47 to 1.54; in 7 of *grossuloides*, 1.31 to 1.40. *Grossuloides* tends to be larger than *grossulum* and to occur at higher altitudes, but these are not absolute differences.

Altagonum nox n. sp.

Description. With characters of genus as described above. Form of rather large *Agonum s. s.*; black, appendages only slightly paler, lateral margins of prothorax and elytra scarcely translucent; upper surface impunctate except sometimes more or less vaguely punctate in and near pronotal foveae, moderately shining, elytra slightly or faintly iridescent; microsculpture fine but apparently normal in form. *Head* .64 & .64 width prothorax; eyes moderately large and prominent, with posterior supraocular setae about between their posterior edges. *Prothorax* rather large and wide; width/length 1.45 & 1.43; base/apex 1.47 & 1.40; sides moderately arcuate for much of length, nearly straight and moderately converging and sometimes slightly sinuate toward base; basal angles obtuse but well defined, only slightly blunted;

lateral margins rather wide especially toward base, moderately reflexed; basal foveae rather deep, not or vaguely punctate; disc normal; anterior and posterior marginal lines entire, the posterior one more lightly impressed. *Elytra* of normal outline and convexity, not or vaguely impressed before middle; basal margin obtusely angulate at humeri; lateral margins average; subapical sinuations rather weak; apices rather narrowly rounded to slightly or not distinctly denticulate sutural angles; striae moderately impressed, not punctate; intervals somewhat convex, 8th and 9th not much modified toward apex, 3rd 3-punctate with punctures normally placed. *Lower surface* virtually impunctate; abdomen not pubescent. *Legs:* 4th hind-tarsal segment rather deeply emarginate but without produced lobes. *Measurements:* length 9.0–9.5; width 3.3–3.5 mm.

Types. Holotype ♂ (Leiden Mus.) and 5 paratypes (2 in M.C.Z. No. 28,644) all from Mist Camp, Snow Mts., **Neth. N. G.**, 1,800 m. (about 5,850 ft.), Jan. (type Jan. 18, 1 paratype Jan. 4) and Feb. 10, 1939 (Toxopeus).

Measured specimens. The ♂ holotype and 1 ♀ paratype.

Notes. This species, which is of course differentiated from others in the key to species, above, will be taken as the standard of comparison for several more or less similar, following forms.

Altagonum magnox n. sp.

Description. Very close to *nox* and answering to the same description (see above) in all details except those noted below. Larger and a little broader; basal foveae and margins of pronotum before them a little more distinctly punctate; elytra a little more iridescent. *Head* .64 & .60 width prothorax. *Prothorax* a little more narrowed in front and less narrowed behind, with sides less converging toward base; width/length 1.38 & 1.45; base/apex 1.56 & 1.59. Other characters as in *nox*. *Male copulatory organs:* Fig. 47. *Measurements:* length 10.6; width 4.2 mm. (both specimens).

Types. Holotype ♂ (Leiden Mus.) from Rattan Camp, Snow Mts., **Neth. N. G.**, 1,200 m. (about 3,900 ft.), Feb.–Mar. 1939 (Toxopeus); and 1 ♀ paratype (M.C.Z. No. 28,645) from Mist Camp, Snow Mts., 1,800 m. (about 5,850 ft.), Feb. 3, 1939 (Toxopeus).

Measured specimens. The types.

Notes. The only characters distinguishing this species from *nox* to which I can give exact expression are the larger size and relatively greater ratio of base/apex of prothorax. The difference in form of prothorax is obvious to the eye.

Altagonum japenox n. sp.

Description. Again very close to *nox*, and answering to the description of the latter (see above) in all details except those noted below. Larger and a little wider than *nox*; legs browner, lateral margins of prothorax yellowish-translucent; elytra more obviously iridescent. *Head* .58 & .58 width prothorax. *Prothorax* relatively a little wider; width/length 1.51 & 1.51; base/apex 1.50 & 1.50. *Measurements:* length 9.9–10.2; width about 3.9 mm.

Types. Holotype ♀ (British Mus.) and 1 ♀ paratype (M.C.Z. No. 28,646) both from Mt. Baduri, Japen Is., **Neth. N. G.**, 1,000 ft., Aug. 1938 (Cheesman).

Measured specimens. The types.

Notes. This species is perhaps even closer to *magnox* (above) than to *nox*, the base-species with which I have compared it. The principal characters distinguishing *japenox* from *magnox* are the obviously pale-translucent prothoracic margins and the relatively slightly narrower head and wider prothorax as shown by the ratios given. It remains to be seen to what extent these differences will hold in series. *Japenox* may prove to be a subspecies of *magnox*, but I am not sufficiently sure of relationships in this group of *Altagonum* to make it a subspecies now.

Altagonum pubinox n. sp.

Description. Again close to *nox*, and answering to the description of the latter (see above) in all details except those noted below. A little smaller and much narrower than *nox*, with elytra obviously impressed before middle and at most only faintly iridescent. *Head* .70 & .70 width prothorax. *Prothorax* much narrower than in *nox;* width/length 1.27 & 1.27; base/apex 1.38 & 1.42; sides rather weakly arcuate for most or all of length, moderately converging and sometimes nearly straight or even faintly sinuate posteriorly; basal angles more obtuse and more blunted than in *nox* primarily because sides of base (in *pubinox*) more rounded-oblique; lateral margins narrower than in *nox*. *Lower surface* as in *nox* except abdomen with a little pubescence near middle of at least basal segments. *Measurements:* length 8.1–9.0; width 3.0–3.4 mm.

Types. Holotype ♂ (Leiden Mus.) and 7 paratypes (some in M.C.Z. No. 28,647) from Sigi Camp, Snow Mts., **Neth. N. G.**, 1,500 m. (about 4,875 ft.), Feb. (type & 3 paratypes specifically Feb. 19, 2 paratypes Feb. 25) 1939 (Toxopeus); and the following additional paratypes from the Snow Mts.: 1, Lower Mist Camp, 1,700 m. (about 5,525 ft.), Jan. 17, 1939 (Toxopeus); 1, Mist Camp, 1,800 m. (about 5,850 ft.), Jan. 1939 (Toxopeus).

Measured specimens. The ♂ holotype and 1 ♀ paratype from Sigi Camp.

Notes. Although this species differs from *nox* (and from *magnox* and *japenox*) by presence of a little pubescence near middle of at least the basal ventral abdominal segments, other characters are so similar that I think the relationship to *nox* is probably close.

Altagonum noctellum n. sp.

Description. Again close to *nox*, and answering to the description of the latter (see above) in all details except those noted below. Much smaller, somewhat narrower, and a little more brownish (less deep black) than *nox*; elytra slightly, sometimes indistinctly impressed before middle, at most faintly iridescent. *Head* .77 & .76 width prothorax. *Prothorax* relatively much narrower than in *nox*; width/length 1.24 & 1.29; base/apex 1.34 & 1.35; sides weakly arcuate anteriorly, straight or slightly sinuate and only moderately converging toward base; basal angles much more obtuse or rounded than in *nox*, chiefly because sides of base rather strongly oblique; lateral margins slightly narrower and less reflexed than in *nox*, and basal foveae shallower, but still moderately impressed. *Lower surface* as in *nox* except abdomen with a little pubescence near middle of at least basal segments. *Measurements:* length 6.8–7.9; width 2.5–2.9 mm.

Types. Holotype ♂ (British Mus.) and 2 paratypes (♂ in M.C.Z. No. 28,648) from Cyclops Mts., **Neth. N. G.**, 3,400–4,500 ft., Mar. 1936 (Cheesman); 3 paratypes from Mt. Lina, Cyclops Mts., 3,500–4,500 ft., Mar. 1936 (Cheesman); and 2 paratypes from Rattan Camp, Snow Mts., 1,200 m. (about 3,900 ft.), Feb.–Mar. 1939 (Toxopeus).

Other material from **Neth. N. G.** as follows: 1, Sabron, Cyclops Mts., 2,000 ft., May 1936 (eyes abnormally prominent) (Cheesman); 1, Camp Nok, Waigeo Is., 2,500 ft., Apr. 1938 (Cheesman).

Measured specimens. The ♂ holotype and 1 ♀ paratype from the Cyclops Mts.

Notes. Although I have compared this with what I have taken as the base-species of this group (*nox*), *noctellum* is actually closer to *pubinox*, which it resembles in ventral pubescence. It is in fact very close to *pubinox*, differing most obviously in smaller size, with head relatively slightly wider, pronotum a little less convex, and elytra less obviously impressed before the middle. It evidently occurs at slightly lower altitudes than *pubinox*. The two Snow Mts. specimens of *noctellum* are not intermediates but show all the characters of the species, including small size (both specimens under 7 mm.).

Altagonum planinox n. sp.

Description. A member of the *nox* group but with form more of *Europhilus* than of *Agonum s. s.* Answering technical description of *nox* (see above) in all details except those noted below. Much smaller, more slender, with flatter pronotum than *nox*; more brownish-black, appendages yellowish-brown, lateral margins of prothorax narrowly but distinctly yellowish-translucent; elytra slightly impressed before middle, at most faintly iridescent. *Head* .80 & .78 width prothorax; eyes a little more prominent than usual in group. *Prothorax* relatively small, subquadrate; width/length 1.36 & 1.38; base/apex 1.37 & 1.39; sides weakly arcuate, appearing subparallel, rather weakly converging and slightly or not sinuate basally; basal angles obtuse, blunted or rather narrowly rounded; lateral margins narrow, very little reflexed; basal foveae scarcely impressed, flat; disc flatter than in *nox*. *Elytra* with basal margin rounded or vaguely angulate at humeri; lateral margins narrow; outer intervals as in *nox*, not much modified toward apex. *Lower surface:* abdomen with some pubescence near middle of all segments. *Measurements:* length 6.5–7.5; width 2.6–2.9 mm.

Types. Holotype ♂ (British Mus.) and 5 paratypes (some in M.C.Z. No. 28,649) from Mt. Lina, Cyclops Mts., **Neth. N. G.**, 3,500–4,500 ft., Mar. 1936 (Cheesman); 2 paratypes, Cyclops Mts. without further locality, 3,400–4,500 ft., Mar. 1936 (Cheesman); and 1 paratype, Rattan Camp, Snow Mts., 1,150 m. (about 3,750 ft.), Feb.–Mar. 1939 (Toxopeus).

Other material. One specimen, Mafulu, **Papua**, 4,000 ft., Jan. 1934 (Cheesman).

Measured specimens. The ♂ holotype and 1 ♀ paratype from Mt. Lina.

Notes. Set beside *nox* this species seems very different indeed, but there is a practically complete transitional series beginning in fact with *magnox* (and *japenox*) through *nox*, *pubinox*, and *noctellum* to the present species, and extending perhaps even to the following ones (*dilutipes* and *europhilum*), which may be transitional toward more fusiform species. The present species (*planinox*) differs from the preceding ones of the series in having paler legs and antennal bases, and a flatter pronotum with scarcely impressed basal foveae.

Altagonum dilutipes n. sp.

Description. With characters of genus as described above. Broad *Agonum*- or *Stenolophus*-like; brownish-black, appendages yellowish-brown, lateral margins of prothorax and elytra yellowish-translucent;

upper surface impunctate except vaguely punctate in pronotal foveae, moderately shining, elytra iridescent; microsculpture about normal except indistinct (presumably very fine and transverse) on elytra. *Head* .71 & .65 width prothorax; eyes moderately large and prominent, with posterior supraocular setae about between their posterior edges. *Prothorax* of moderate size; width/length 1.29 & 1.34; base/apex 1.24 & 1.28; sides moderately arcuate for most or all of length, sometimes nearly straight (and converging) toward base; basal angles broadly rounded, very obtuse or not at all defined; lateral margins moderate, wider basally, moderately reflexed; basal foveae average, vaguely punctate; disc normal; anterior and posterior marginal lines entire except posterior one sometimes vague near middle. *Elytra* rather broad, of normal outline and convexity, not or only faintly impressed before middle; basal margin strongly, almost rectangularly angulate at humeri (but points of angulations more or less blunted); lateral margins rather wide (in genus); subapical sinuations weak; apices rather narrowly rounded to subdenticulate sutural angles; striae moderately impressed, not punctate; intervals somewhat convex, 8th and 9th not much modified toward apex, 3rd normally 3-punctate. *Lower surface* impunctate; abdomen not pubescent. *Legs:* 4th hind-tarsal segment simply emarginate, not lobed. *Measurements:* length 6.6–7.8; width 2.5–3.0 mm.

Types. Holotype ♂ (British Mus.) and 3 paratypes (1 in M.C.Z. No. 28,650) from Mt. Lina, Cyclops Mts., **Neth. N. G.**, 3,500–4,500 ft., Mar. 1936 (Cheesman); 2 paratypes, Cyclops Mts. without further locality, 3,500 & 3,400–4,500 ft., Mar. 1936 (Cheesman); and 2 paratypes, Rattan Camp, Snow Mts., 1,150 & 1,200 m. (about 3,750 & 3,900 ft.), Feb.–Mar. 1939 (Toxopeus).

Measured specimens. The ♂ holotype, and 1 ♀ paratype from the Cyclops Mts.

Notes. This species is sufficiently distinguished from others in the key to species, above.

Altagonum europhilum n. sp.

Description. With characters of genus as described above. Form of *Agonum* subgenus *Europhilus;* brownish-black, appendages somewhat paler, lateral margins of prothorax and elytra only slightly translucent; upper surface virtually impunctate, moderately shining, elytra not or faintly iridescent; microsculpture about normal. *Head* .67 & .70 width prothorax; eyes rather large but only a little prominent, with posterior supraocular setae about between their posterior edges. *Prothorax* rather small, subquadrate, appearing almost as long as wide

but width/length actually 1.15 & 1.18; base/apex about 1.41 & 1.32; sides slightly arcuate for most of length, nearly straight and slightly converging basally; posterior angles very obtuse, almost rounded out, partly because sides of base rounded-oblique; lateral margins narrow anteriorly, wider basally, slightly reflexed; posterior-lateral setae set a little in from edges of margins near posterior angles; basal foveae slightly impressed, not distinctly punctate; disc weakly convex, with middle line and transverse impressions only slightly impressed; anterior and posterior marginal lines nearly entire, but light and more or less interrupted at middle. *Elytra* long-oval, normally convex, only faintly impressed before middle; basal margin almost rectangular at humeri; lateral margins rather narrow; subapical sinuations almost obliterated, sides of elytra curving in almost evenly to subdenticulate sutural angles; striae moderately impressed, impunctate; intervals moderately convex, 8th and 9th not much modified toward apex, 3rd normally 3-punctate. *Lower surface* impunctate; abdomen not pubescent. *Legs:* 4th hind-tarsal segment simply emarginate. *Measurements:* length 7.8–7.9; width 2.8–2.9 mm.

Types. Holotype ♂ (Leiden Mus.) from Mist Camp, Snow Mts., **Neth. N. G.**, 1,800 m. (about 5,850 ft.), Jan. 1939 (Toxopeus); and 1 ♂ paratype (M.C.Z. No. 28,651) from Top Camp, Snow Mts., 2,100 m. (about 6,825 ft.), Jan. 26, 1939 (Toxopeus).

Measured specimens. The types.

Notes. This species may be related to both *dilutipes* and *planinox* (above), and through them to the *nox* group of *Altagonum*, but it differs in so many ways that I have given it a full description. The following is a list of the more important differences between the present species and *planinox:* head relatively narrower, with much less prominent eyes; prothorax longer, with posterior-lateral setae set in from edges of margins, and with less impressed anterior and posterior marginal lines; elytra more oval, with humeral margins much more strongly angulate, and with subapical sinuations almost obliterated; abdomen not pubescent. In the face of this list of differences it is obviously unwise to assume a real relationship between this species and *planinox*. The relationship with *dilutipes* is more probable. The present species has the form of a slender *Dicranoncus*, but the tarsal claws are not toothed.

Altagonum pallinox n. sp.

Description. With characters of genus as described above. Form of a large, rather slender, somewhat depressed *Bembidion* or *Europhilus*; brown, head slightly darker, abdomen with irregular pale areas, ap-

pendages yellowish, lateral marginal gutters of prothorax and elytra narrowly yellowish; surface only moderately shining, not iridescent; microsculpture normal. *Head* .86 & .85 width prothorax; eyes large, prominent, with posterior supraocular setae about between their posterior edges. *Prothorax* somewhat transversely subquadrate or subcordate; width/length 1.34 & 1.38; base/apex 1.27 & 1.24; sides less arcuate than usual, moderately sinuate about 1/6 of length before base; basal angles slightly obtuse but well defined; lateral margins rather narrow; basal foveae poorly defined, only slightly impressed, slightly roughened but not punctate; anterior marginal line faint or interrupted at middle, posterior one vague. *Elytra* rather narrow, subparallel, a little less convex than usual, with disc broadly, vaguely impressed about 2/5 from base; basal margin rounded or faintly angulate at humeri; subapical sinuations moderate; apices moderately rounded, distinctly but finely and bluntly subdenticulate at sutural angles; striae rather deep, not distinctly punctulate; intervals convex, 8th and 9th and usually 7th longitudinally impressed or sulcate toward apex, 3rd normally 3-punctate. *Lower surface* virtually impunctate; abdomen with a little pubescence near middle near base. *Legs:* 4th hind-tarsal segment simply emarginate. *Measurements:* length 6.8–7.6; width 2.4–2.8 mm.

Types. Holotype ♂ (British Mus.) and 4 paratypes (2 in M.C.Z. No. 28,688) from Cyclops Mts., **Neth. N. G.**, 3,400–4,500 ft., Mar. 1936 (Cheesman). Additional paratypes as follows: **Neth. N. G.:** 1, Mt. Lina, Cyclops Mts., 3,500–4,500 ft., Mar. 1936 (Cheesman); 1, Cyclops Mts. without more exact data (Cheesman). **Papua:** 1, Mondo, 5,000 ft., Jan.–Feb. 1934 (Cheesman).

Measured specimens. The ♂ holotype and 1 ♀ paratype from the Cyclops Mts.

Notes. This is a very distinct species, distinguishable by characters given in the key. I have associated it with the *nox* group, but I am not sure there is a close relationship. The species has a remarkable superficial similarity to the *Notagonum* of the *angustellum* group, but it differs from them not only in absence of the anterior-lateral pronotal setae but also in impression of the outer elytral intervals toward apex and in form (simply emarginate) of the 4th hind-tarsal segment.

Altagonum tutum n. sp.

Description. With characters of genus as described above. Form nearly that of small, rather slender *Agonum s. s.*; piceous-black, legs brownish-piceous, antennae browner, lateral margins of prothorax vaguely translucent; upper surface nearly impunctate, moderately

shining, not iridescent; microsculpture normal, light on head and pronotum. *Head* .82 width prothorax; eyes large, moderately prominent, with posterior supraocular setae about between their posterior edges; neck-constriction vague. *Prothorax* rather small, subquadrate, widest about middle, rather strongly narrowed in front; width/length 1.23; base/apex 1.44; anterior angles scarcely advanced; sides moderately arcuate for much of length, rather broadly sinuate before base; basal angles approximately right but narrowly rounded; lateral margins rather narrow, moderately reflexed posteriorly; posterior-lateral setae on edges of margins at basal angles; basal foveae normal, vaguely punctate; disc normal; anterior and posterior marginal lines entire. *Elytra* normal in outline, a little more convex than usual, not impressed on disc; basal margin only vaguely angulate at humeri; lateral margins rather narrow; subapical sinuations moderate, each leading onto a short apical spine almost at sutural angle; striae well impressed, impunctate; intervals moderately convex, 8th and 9th not much modified toward apex, 3rd normally 3-punctate. *Lower surface* virtually impunctate; abdomen not pubescent. *Legs:* 4th hind-tarsal segment simply emarginate. *Measurements:* length 7.7; width 2.8 mm.

Type. Holotype ♀ (British Mus.) from Mt. Nok, Waigeo Is., **Neth. N. G.**, 2,500 ft., May 1938 (Cheesman); unique.

Measured specimen. The type.

Notes. This is an inconspicuous but safely characterized species, placed in the key to species (above) but not closely related to any other species known to me. It may have originated independently from *Notagonum* by development of sutural spines and loss of the anterior-lateral pronotal setae.

Altagonum caducum n. sp.

Description. With characters of genus as described above. Form nearly of elongate *Calathus* (Fig. 6); brown to brownish-black, appendages brown, lateral margins of prothorax broadly and plainly, of elytra not distinctly yellowish-translucent; upper surface impunctate, moderately shining, not iridescent; microsculpture light and isodiametric on head, very light (sometimes scarcely visible) and transverse on disc of pronotum, distinct and transverse on elytra. *Head* .76, .74, & .73 width prothorax; eyes large and moderately prominent, with posterior supraocular setae about between their posterior edges; neck-constriction distinct but not deep. *Prothorax* strongly narrowed in front, only slightly so behind; width/length 1.33, 1.30, & 1.32; base/apex 1.46, 1.53, & 1.53; sides rather weakly arcuate for much of length, broadly but slightly sinuate before rectangular, scarcely blunted pos-

terior angles; lateral margins rather wide especially toward base, moderately reflexed; posterior-lateral setae on edges of margins almost at basal angles; basal foveae rather deep, not or at most vaguely punctate; disc normal; anterior and posterior marginal lines entire. *Elytra* rather ample, of average outline and convexity, distinctly impressed before middle; basal margin obtusely angulate or subangulate at humeri; lateral margins narrow; subapical sinuations moderate or rather weak; apices each rounded-prominent about opposite 3rd interval, minutely denticulate or subdenticulate at sutural angle; striae moderately impressed, impunctate; intervals slightly convex, 8th and 9th not much modified toward apex, 3rd 3-punctate, punctures normally placed except posterior one often not so far back as usual (exact position variable in both Mt. Misim and Snow Mts. series). *Lower surface* virtually impunctate; abdomen not pubescent. *Legs:* 4th hind-tarsal segment with a short outer and still shorter inner lobe. *Male copulatory organs:* Fig. 48. *Measurements:* length 9.4–11.0; width about 3.5–4.1 mm.

Types. Holotype ♂ (M.C.Z. No. 28,652) and 8 paratypes from Mt. Misim, Morobe Dist., **N-E. N. G.** (Stevens). Additional paratypes from **Neth. N. G.** as follows: 2, Cyclops Mts., 3,400–4,500 ft., Mar. 1936 (Cheesman); and from the Snow Mts.: 8, Sigi Camp, 1,500 m. (about 4,875 ft.), Feb. 1939; 1, Lower Mist Camp, 1,700 m. (about 5,525 ft.), Jan. 17, 1939; 30, 1,800 m. (about 5,850 ft.), Dec. 30, 1938 & Jan. 1939; 2, Top Camp, 2,100 m. (about 6,825 ft.), Jan. 25 & 26, 1939; 1, Ibele (Iebele) Camp, 2,250 m. (about 7,325 ft.), Nov. 1938 (all Snow Mts. specimens collected by Toxopeus).

Measured specimens. Holotype ♂, 1 ♀ paratype from Mt. Misim, & 1 ♂ paratype from Mist Camp, Snow Mts.

Notes. Although not a striking species, this is a very distinct one apparently not closely related to any other known to me. It may lead toward *sphodrum* etc. (below), but the outer elytral intervals are not impressed as they are in the *sphodrum* group; the abdomen is not pubescent as it is in *sphodrum* and its closest ally, *postsulcatum*; and the 4th hind-tarsal segment is different, briefly lobed externally in *caducum*, but simply emarginate in the *sphodrum* group. The series from Mt. Misim and that from the Snow Mts. agree almost perfectly in size, proportions, and structural details. The Snow Mts. specimens are a little darker, but the difference is slight and inconstant and may be due at least partly to methods of preservation: the Mt. Misim specimens, in alcohol; the Snow Mts. ones, apparently dry.

Altagonum sphodrum n. sp.

Description. With characters of genus as described above. Form of a rather slender, large-headed sphodrine; piceous, appendages brownish, lateral margins of prothorax and elytra scarcely translucent; upper surface virtually impunctate, only moderately shining, not iridescent; microsculpture normal. *Head* large, appearing almost wide as prothorax but actually .82 & .81 as wide; eyes reduced, only moderately prominent; genae about as long as eyes, oblique, straight or slightly convex in profile; posterior supraocular setae behind line of posterior edges of eyes; neck-constriction distinct, moderately impressed; front irregularly convex, with moderate anterior impressions. *Prothorax* subquadrate; width/length 1.18 & 1.20; base/apex 1.28 & 1.20; sides weakly arcuate anteriorly, broadly sinuate well before basal angles; latter right-acute, accurately formed; lateral margins rather wide (in genus), moderately reflexed (outer edges more so than margins as wholes); posterior-lateral setae on edges of margins almost at basal angles; basal foveae rather shallow and poorly defined, a little roughened but not punctate; disc rather flat; middle line and transverse impressions poorly impressed; anterior and posterior marginal lines variable, not well impressed. *Elytra* rather narrow and long, otherwise about normal in form and convexity, not or only faintly impressed before middle; basal margin rather strongly but a little obtusely angulate at humeri; lateral margins rather narrow; subapical sinuations very slight; apices independently rounded, with sutural angles variable, sometimes rounded, sometimes obtuse and vaguely denticulate; striae moderately impressed, impunctate; intervals slightly convex, 7th and 8th toward apex and 9th for much of length more or less impressed longitudinally, 3rd usually normally 3-punctate (but only 2-punctate on left elytron of type). *Lower surface* roughened but virtually impunctate, except abdomen with fine punctation and extensive but inconspicuous pubescence. *Legs:* 4th hind-tarsal segment simply emarginate, not lobed but with outer apical angle slightly more prominent than inner one; claws simple (not modified as in many true sphodrines). *Male copulatory organs:* Fig. 49. *Measurements:* length 10.5–12.0; width 3.4–4.1 (types only).

Types. Holotype ♂ (M.C.Z. No. 28,653) and 2 ♀ ♀ paratypes from Mt. Wilhelm, Bismarck Range, **N-E. N. G.**, 7,000–10,000 ft., Oct. 1944 (Darlington), under cover on the ground in heavy forest.

Other material. Besides the types I have a fourth (♀) specimen from the same locality which is larger (13.1 by 4.7 mm.), with somewhat more prominent eyes and relatively wider prothorax (width/length 1.29). This specimen is probably referable to *sphodrum,* but I have not included it in the type series.

Measured specimens. The ♂ holotype and 1 ♀ paratype.

Notes. This species is very distinct from any of the preceding ones in form and other characters. It has, however, two apparent relatives, treated below. In describing them I have taken *sphodrum* as the base-species for comparison.

Altagonum postsulcatum n. sp.

Description. With characters of genus as described above. Apparently closely related to the preceding (*sphodrum*) and answering to the same description (see above) in all details except those noted below. Form more *Calathus*-like than sphodrine; color about as in *sphodrum* except elytra more shining or even faintly iridescent in strong light; microsculpture same except finer and more transverse on elytra. *Head* relatively narrower than in *sphodrum*, .77 and .76 width prothorax, but with larger and more prominent eyes and short, oblique genae; posterior supraocular setae only slightly if at all behind line of posterior edges of eyes. *Prothorax* much more narrowed in front; width/length 1.30 & 1.38; base/apex 1.40 & 1.43; sides weakly arcuate, straight and slightly or scarcely converging and usually slightly sinuate toward base; basal angles right or slightly obtuse; disc normal; anterior and posterior marginal lines entire. *Elytra* slightly broader than in *sphodrum*, sometimes more distinctly impressed before middle; apices usually vaguely or distinctly denticulate; outer intervals impressed about as in *sphodrum*. *Lower surface* less roughened than in *sphodrum* and abdomen less extensively pubescent, but still plainly so especially near middle basally. *Legs:* 4th hind-tarsal segment emarginate. *Measurements:* length 9.0–9.9; width 3.3–3.7 mm.

Types. Holotype ♂ (Leiden Mus.) and 9 paratypes (some in M.C.Z. No. 28,654) from Mist Camp, Snow Mts., **Neth. N. G.**, 1,800 m. (about 5,850 ft.), Jan. (some paratypes Dec. 30, 1938, & Jan. 7 & 9) 1939 (Toxopeus); and the following additional paratypes all from the Snow Mts.; 5, Sigi Camp, 1,500 m. (about 4,875 ft.), Feb. (including Feb. 19 & 25) 1939; 1, mountain slope above Bernhard Camp, 1,700 m. (about 5,525 ft.), Jan. 7, 1939; 1, Top Camp, 2,100 m. (about 6,825 ft.), Feb. 8, 1939; and 4, Ibele (Iebele) Camp, 2,250 m. (about 7,325 ft.), Nov. & Nov.–Dec. 1939 (all specimens collected by Toxopeus).

Other material. One ♀ from Mt. Wilhelm, Bismarck Range, **N-E. N. G.**, 7,000–10,000 ft., Oct. 1944 (Darlington), in forest. This specimen differs slightly from the types in form and has the elytra a little less shining, with less strongly transverse microsculpture, but these and other differences are so small that I do not care to make them the basis of even a new subspecies without more material. The proportions

of this specimen are: head/prothorax .73; prothoracic width/length 1.36; base/apex 1.38. Its length is 10.0 mm.

Measured specimens. Holotype ♂ and 1 ♀ paratype from Mist Camp.

Notes. This species is adequately distinguished from *sphodrum* and others in the key to species of *Altagonum*, above.

Altagonum misim n. sp.

Description. With characters of genus as described above. Probably related to *sphodrum*; differing from latter in many details, but described partly by comparison in order to stress both similarities and differences. Form only vaguely sphodrine, more *Colpodes*-like; color, and sculpture of upper surface about as in *sphodrum*. *Head* smaller but with much larger eyes; .79 & .73 width prothorax; eyes large, prominent, with posterior supraocular setae before line of their posterior edges; neck-constriction scarcely indicated; front normally convex, with rather slight anterior impressions. *Prothorax* wider and relatively more narrowed in front than in *sphodrum*; width/length 1.36 & 1.44; base/apex 1.44 & 1.47; sides moderately arcuate for much of length, more or less strongly sinuate near base; basal angles right; lateral margins moderate, wider basally, moderately reflexed; posterior-lateral setae as in *sphodrum*; basal foveae deeper than in *sphodrum*, indistinctly punctate; disc normal; anterior and posterior marginal lines entire, well impressed. *Elytra* long and rather ample, a little less convex than usual, slightly impressed before middle; basal margin obtusely angulate or subangulate at humeri; lateral margins rather narrow; subapical sinuations moderate; apices somewhat produced, each with a short tooth or abrupt angulation about opposite 3rd interval and a stronger tooth (almost a short spine) at sutural angle; striae and intervals about as in *sphodrum*, with outer intervals impressed in about same way. *Lower surface* virtually impunctate; abdomen not pubescent. *Legs:* 4th hind-tarsal segment simply emarginate, as in *sphodrum*. *Measurements:* length 12.4–13.7; width 4.2–5.0 mm.

Types. Holotype ♀ (M.C.Z. No. 28,655) and 1 ♀ paratype from Mt. Misim, Morobe Dist., **N-E. N. G.**, the type specifically from 6,400 ft., Mar. (Stevens).

Measured specimens. The types.

Notes. This species probably belongs near *sphodrum* and *postsulcatum* (above) because of the impressed outer elytral intervals and form of prothorax, which agrees closely with that of *postsulcatum* though not of *sphodrum* itself, but *misim* differs from both these species in having elytra armed at apex and abdomen not pubescent, as well

as in other less significant details: larger eyes, virtually no neck-constriction, etc.

Altagonum cheesmani n. sp.

Description. With characters of genus as described above. Rather large, rather slender, subfusiform; black, elytra (except suture) green, appendages yellowish- or brownish-red, lateral margins of prothorax yellowish-translucent; upper surface impunctate except slightly punctate in basal foveae and marginal gutters of pronotum, moderately shining, not iridescent; microsculpture of head and pronotal disc not visible at 54×, of elytra distinct and transverse. *Head* .80 width pronotum; eyes large and very prominent, with posterior supraocular setae slightly before line of their posterior edges; neck-constriction slight and not well defined; front slightly convex, with moderate anterior impressions. *Prothorax* widest about middle, strongly narrowed in front, only slightly so behind; width/length 1.27; base/apex 1.69; anterior angles not at all advanced, so front of prothorax almost evenly truncate; sides moderately rounded for much of length, slightly sinuate toward base; basal angles right-obtuse, blunted; lateral margins rather wide but not well defined, slightly reflexed anteriorly, rather strongly so posteriorly; posterior-lateral setae on edges of margins at posterior angles; basal foveae deep, slightly punctate; disc normal, with light middle line and rather deep transverse impressions; anterior and posterior marginal lines fine but entire. *Elytra* long, subparallel for much of length, more convex than usual, not impressed on disc; basal margin obtusely angulate at humeri; lateral margins narrow; subapical sinuations moderate, broad, each leading onto a short, strong spine opposite 3rd interval; apices inside of spines strongly emarginate; sutural angles denticulate; striae light, punctulate; intervals flat, 8th and 9th not much modified toward apex, 3rd normally 3-punctate. *Lower surface* distinctly punctate only at sides of mesosternum; abdomen not pubescent. *Legs:* 4th hind-tarsal segment rather deeply emarginate, almost lobed, but outer angle or lobe not obviously longer than inner. *Measurements:* length 13.1; width 4.3 mm.

Type. Holotype ♀ (British Mus.) from Mafulu, **Papua**, 4,000 ft., Jan. 1934 (Cheesman); unique.

Measured specimen. The type.

Notes. This species, although placed among others in the key to species of *Altagonum* (above), is quite unlike any other known to me. It may be independently derived from *Colpodes*. It is more fusiform than any *Colpodes* known from New Guinea, however, and of course it lacks the anterior-lateral pronotal setae. It is a fine species, and I

take great pleasure in naming it for Miss L. Evelyn Cheesman, who collected it and so many other interesting Carabidae in New Guinea.

Altagonum scapha n. sp.

Description. With characters of genus as described above. Rather small, slender, fusiform; brownish-black, legs only slightly paler, antennae yellowish, sides and sometimes base of prothorax narrowly, vaguely paler; upper surface impunctate, moderately shining, not distinctly iridescent; microsculpture normal but light. *Head* narrow, .65, .62, & .63 width prothorax; eyes large but less convex than usual, not very prominent, with posterior supraocular setae about between their posterior edges; neck constriction vague; front normal. *Prothorax* much narrowed in front, scarcely at all so behind; width/length 1.24, 1.28, & 1.29; base/apex 1.67, 1.80, & 1.70; anterior angles scarcely advanced; sides moderately arcuate anteriorly, nearly straight posteriorly, not distinctly sinuate; basal angles almost right except narrowly rounded; lateral margins narrow, scarcely reflexed; posterior-lateral setae on flat surface a little in from edges of margins near basal angles; basal foveae slight, almost obsolete; disc only weakly convex, with median line and transverse impressions weak; anterior and posterior marginal lines light or interrupted at middle. *Elytra* elongate-oval, more pointed behind and more convex than usual; basal margin about rectangular at humeri; lateral margins narrow; subapical sinuations variable, present only when elytra spined; apices each with a short spine or acute angulation opposite 3rd interval, then oblique forward and more or less emarginate to more or less strongly denticulate sutural angles; striae rather lightly impressed, not punctate; intervals flat or slightly convex, 8th and 9th not much modified toward apex, 3rd 2-punctate (anterior puncture absent on both sides in all specimens). *Lower surface* impunctate; abdomen not pubescent; prosternal process simple or vaguely margined at apex. *Legs:* hind tarsi very slender; 4th hind-tarsal segment emarginate or with very short lobes, with outer angle always a little longer than inner. *Measurements* (types): length 7.2–8.0; width 2.6–2.9 mm.

Types. Holotype ♂ (Leiden Mus.) from Rattan Camp, Snow Mts., **Neth. N. G.**, 1,150 m. (about 3,750 ft.), Feb.–Mar. 1939 (Toxopeus); 1 ♂ paratype (M.C.Z. No. 28,656) from Top Camp, Snow Mts., 2,100 m. (about 6,825 ft.), Jan. 22, 1939 (Toxopeus); 1 ♀ paratype (British Mus.) from Camp Nok, Waigeo Is., 2,500 ft., Apr. 1938 (Cheesman).

Other material. The type of *scapha* has the elytra spined; the ♂ paratype, acutely angulate. The ♀ paratype from Waigeo Is. has

them spined and matches the type in all other significant non-sexual characters. I have examined also 2 additional, larger specimens from the Snow Mts. In one, a ♂ from Ibele (Iebele) Camp, 2,250 m. (about 7,325 ft.), Nov. 1938 (Toxopeus), the apical angulations of the elytra are slightly obtuse rather than acute, less prominent even than in the ♂ paratype, and the proportions are head .61 width prothorax, prothoracic width/length 1.15 and base/apex 1.81, and length 9.3, width 3.1 mm. In this ♂ and in the 2 ♂♂ types the apex of the aedeagus is recurved or barbed below, the exact form being a little different in each specimen, but within the possible range of variation of a species. The final specimen is a ♀ from Mist Camp, 1,800 m. (about 5,850 ft.), Jan. 1939 (Toxopeus). It has the elytra spined as in the type, but it differs slightly in proportions and is much larger: head .57 width prothorax, prothoracic width/length 1.26, base/apex 1.73, length 11.3, width 4.0 mm. The significance of these variations cannot be determined without more material.

Measured specimens. The 3 types.

Notes. This species is sufficiently compared with others in the key to species of *Altagonum*, above.

Altagonum regiscapha n. sp.

Description. With characters of genus as described above. Similar to *scapha*, to the description of which (see above) it answers in all details except those noted below. Broader than *scapha*; elytra inconspicuously purple with greenish reflections, legs dark reddish; microsculpture of head and pronotum so light as to be scarcely visible. *Head* with eyes somewhat more prominent than in *scapha*, .65 width prothorax. *Prothorax* relatively wider but otherwise similarly formed; width/length 1.36; base/apex 1.78; basal angles slightly more obtuse; lateral margins wider; posterior-lateral setae virtually on (not well inside of) edges of margins at basal angles; basal foveae more distinct, broad, but still shallow and poorly defined. *Elytra* slightly broader and less pointed behind; subapical sinuations virtually absent; apices rectangular about opposite 3rd intervals, then oblique forward to slightly denticulate sutural angles; 3rd interval 2-punctate as in *scapha*. *Legs:* 4th hind-tarsal segment simply emarginate, not lobed. *Measurements:* length 9.1; width 3.4 mm.

Type. Holotype ♀ (Leiden Mus.) from Mist Camp, Snow Mts., **Neth. N. G.**, 1,800 m. (about 5,850 ft.), Jan. 1939 (Toxopeus); unique.

Measured specimen. The type.

Notes. This species is very similar to *scapha*, but whether it is an actual relative or a convergent form I do not know. The difference

in position of the posterior-lateral setae and the somewhat different form of the 4th hind-tarsal segment suggest that the relationship may not be very close.

Altagonum latilimbus n. sp.

Description. With characters of genus as described above. Form of rather broad *Calathus*; brownish-black, broadly margined with yellow (yellow covers actual margins of prothorax, margins and about 3 outer intervals in basal half of elytra, and a still wider zone posteriorly, including elytral apices; boundary of dark discal area fairly regular, dark color not forming a narrow sutural stripe toward apex), sides and apex of abdomen narrowly margined or spotted with yellow, appendages yellow; upper surface impunctate, only moderately shining, not distinctly iridescent; microsculpture normal. *Head* small, .57 & .56 width prothorax; eyes moderately large and prominent, with posterior supraocular setae about between their posterior edges; neck not constricted above; front weakly convex, with weak anterior impressions. *Prothorax* rather broad, much narrowed in front, scarcely or not narrowed behind; width/length 1.48 & 1.44; base/apex 1.61 & 1.59; anterior angles broadly and rather strongly advanced, subacute except narrowly rounded; sides weakly arcuate for much of length, almost straight and sometimes very slightly sinuate posteriorly; basal angles subrectangular except very narrowly rounded; lateral margins narrow anteriorly, wide and flat posteriorly; posterior-lateral setae on flat surfaces of margins about equally distant from inner and outer edges and base, or nearer inner edges; basal foveae almost obsolete, not distinct from flattened margins, not or at most vaguely punctate; disc moderately convex, with middle line and transverse impressions slight; anterior marginal line entire, posterior one faint or interrupted at middle. *Elytra* nearly normal in outline and only slightly more convex than usual, with disc not or faintly impressed; basal margin almost rectangular at humeri (but points of angles blunted); lateral margins average; subapical sinuations very slight; apices simple, with sutural angles obtuse, not or faintly denticulate; striae rather lightly impressed, impunctate; intervals nearly flat or slightly convex, 8th and 9th not much modified toward apex, 3rd normally 3-punctate. *Lower surface* impunctate; abdomen not pubescent. *Legs:* 4th hind-tarsal segment emarginate, not lobed. *Measurements:* length 8.5–8.9; width 3.4–3.5 mm.

Types. Holotype ♂ (Leiden Mus.) and 2 ♂♂ paratypes (1 in M.C.Z. No. 28,657) from Mist Camp, Snow Mts., **Neth. N. G.**, 1,800 m. (about 5,850 ft.), Jan. (the paratypes Jan. 9 & 11) 1939;

1 ♂ paratype from Sigi Camp, Snow Mts., 1,500 m. (about 4,875 ft.), Feb. 25, 1939; and 1 ♂ paratype and hind-body of another specimen from Top Camp, Snow Mts., 2,100 m. (about 6,825 ft.), Jan. 27 & Feb. 8, 1939; (all specimens collected by Toxopeus).

Measured specimens. The ♂ holotype and 1 ♂ paratype from Mist Camp.

Notes. So far as I know, this species has only one close relative, described below. It may be more distantly related to *scapha* (above), which also is fusiform, with posterior pronotal setae somewhat removed from the edges of the margins, but *latilimbus* is very different from *scapha* in coloration, strongly advanced anterior prothoracic angles, simple elytral apices, and other details.

Altagonum paralimbus n. sp.

Description. Very close to *latilimbus*, to the description of which (see above) it answers in all details not noted below. Slightly narrower than *latilimbus*; yellow margins of elytra narrower anteriorly (including only about 2 intervals), broad but irregularly limited posteriorly, with dark discal color extending along sutural intervals toward (but not to) apex; surface a little more shining than in *latilimbus*. *Head* .57 & .57 width prothorax; eyes slightly less prominent than in *latilimbus*. *Prothorax:* width/length 1.32 & 1.34; base/apex 1.51 & 1.48. *Elytra* with disc a little more distinctly impressed slightly before middle than in *latilimbus*. *Male copulatory organs:* Fig. 50. *Measurements:* length 9.9–10.2; width 3.7–3.8 mm.

Types. Holotype ♂ (M.C.Z. No. 28,658) from Mt. Misim, Morobe Dist., **N-E. N. G.** (Stevens); and 1 ♀ paratype (British Mus.) from Mt. Tafa, **Papua**, 8,500 ft., Mar. 1934 (Cheesman).

Measured specimens. The types.

Notes. As compared with *latilimbus*, this differs chiefly in its more slender form and more irregular boundary of dark and light areas toward apex of elytra.

Altagonum nudicolle n. sp.

Description. With characters of genus as described above. Form of rather broad *Calathus*; dark-brown or brownish-black, legs not much paler, antennae a little redder, lateral margins of prothorax slightly reddish-translucent; surface not very shining, not iridescent; microsculpture very distinct, normal except meshes less transverse than usual on elytra. *Head* .67 & .64 width prothorax; eyes moderately large and prominent, with posterior supraocular setae about between

their posterior edges; neck slightly impressed above; front somewhat irregularly convex, with slight anterior impressions. *Prothorax* widest near middle, strongly narrowed anteriorly, scarcely if at all so posteriorly; width/length 1.33 & 1.35; base/apex 1.65 & 1.64; anterior angles moderately advanced, would be right or slightly acute except narrowly rounded; sides arcuate for much of length, then straight or slightly and broadly sinuate before base; posterior angles approximately right, scarcely blunted; lateral margins rather wide especially toward base but only moderately reflexed; both pairs (posterior as well as anterior) lateral setae absent; basal foveae slight, scarcely distinct from ends of lateral margins, impunctate; disc less convex than usual; anterior marginal line entire, posterior one usually entire but sometimes vague at middle. *Elytra* rather broad and ample, nearly normal in outline but more convex than usual; basal margin rectangular at humeri; lateral margins narrow; subapical sinuations slight or nearly absent; apices rather narrowly rounded; sutural angles obtuse or rounded, not denticulate; striae lightly impressed, not punctate; intervals flat or nearly so, more or less vaguely longitudinally impressed at extreme apices, but 9th not or only vaguely impressed, 3rd normally 3-punctate. *Lower surface* impunctate; abdomen not pubescent. *Legs:* 4th hind-tarsal segment with short outer and still shorter inner lobe. *Male copulatory organs:* Fig. 51. *Measurements:* length 11.2–12.3; width 4.3–5.1 mm.

Types. Holotype ♂ (M.C.Z. No. 28,659) and 67 paratypes all from Mt. Wilhelm, Bismarck Range, **N-E. N. G.**, 7,000–10,000 ft., Oct. 1949 (Darlington), in and under various ground-cover in forest.

Measured specimens. The ♂ holotype and 1 ♀ paratype.

Notes. The slight impression of the elytral intervals and some other details suggest that this species may be related to *sphodrum* and *postsulcatum* (above), but it is much broader, without abdominal pubescence, and has lost the posterior- as well as the anterior-lateral pronotal setae.

Altagonum fatuum n. sp.

Description. With characters of genus as described above. Form nearly that of slender *Platynus*, with slender appendages; brownish-black, elytra browner, appendages yellow, lateral margins of prothorax and elytra yellow-translucent, epipleurae yellow, sides and apex of abdomen broadly yellow; upper surface virtually impunctate, moderately shining, not iridescent; microsculpture normal, distinct. *Head* rather long, .74 & .72 width prothorax; eyes slightly reduced, only moderately prominent; genae about half as long as eyes, oblique;

posterior supraocular setae slightly behind line of posterior edges of eyes; neck slightly impressed above; front normal. *Prothorax* rather narrow, subquadrate, moderately narrowed anteriorly, only slightly so posteriorly; width/length 1.09 & 1.14; base/apex 1.40 & 1.43; anterior angles scarcely advanced; sides rather weakly arcuate for much of length, more or less straight and sometimes faintly sinuate toward base; posterior angles rather narrowly rounded; lateral margins rather narrow, only a little wider toward base, moderately reflexed; both pairs lateral pronotal setae absent; basal foveae normal, a little irregular at bottom but not distinctly punctate; disc normal; anterior and posterior marginal lines entire. *Elytra* long but otherwise of nearly normal outline, slightly more convex than usual, with disc not impressed; basal margin distinctly but somewhat obtusely angulate at humeri; lateral margins narrow; subapical sinuations faint or absent; apices moderately rounded to suture; sutural angles not or faintly denticulate; striae moderately impressed, not punctate; intervals nearly flat or slightly convex, 8th and 9th not much modified toward apex, 3rd impunctate. *Lower surface* impunctate; abdomen not pubescent. *Legs:* 4th hind-tarsal segment emarginate, not lobed. *Measurements:* length 10.0–10.3; width 3.6–3.9 mm.

Types. Holotype ♂ (British Mus.) and 2 (♂ ♀) paratypes (♂ in M.C.Z. No. 28,660) all from Mt. Tafa, **Papua**, 8,500 ft., Mar. 1934 (Cheesman).

Measured specimens. The ♂ holotype and 1 ♀ paratype.

Notes. This species, although placed in the key to species of *Altagonum* (above), is very different from any other known to me.

Maculagonum new genus

Diagnosis. Rather small (5.7 to 8.9 mm), either narrow *Agonum*-like or more or less fusiform; elytra always mottled or blotched with dark and pale; wing-and-seta formula +w, ++, (−)+, −(+)+; last ventral abdominal segment of ♂ rather deeply notched at middle of apex; genus otherwise within range of variation of *Altagonum* (above).

Description. Form and color as indicated above; upper surface impunctate (except in *setipox*), more or less shining, not iridescent; microsculpture variable. *Head* moderate or small, usually rather short (in tribe), sometimes slightly elongate; neck more or less impressed above except in *scaphipox*; eyes variable, either large, or slightly reduced in size and prominence, or small but abruptly prominent; both pairs supraocular setae present; antennae normal; mentum tooth triangular. *Prothorax* somewhat variable, more or less strongly

narrowed in front (least so in *pox*), with anterior angles not advanced, more or less rounded out; anterior-lateral setae absent (except in *setipox*), posterior-lateral ones present on or just within basal angles. *Elytra* long and/or ample, more convex than usual; disc not distinctly impressed; basal margin entire, variably angulate at humeri; apices variable but never spined nor abruptly angulate; intervals not much modified toward apex (except 8th more convex than usual toward apex in *scaphipox*); 3rd interval 2- or 1-punctate (anterior and sometimes middle puncture absent). *Inner wings* full. *Lower surface* impunctate; abdomen not pubescent; prosternal process simple. *Legs:* hind tibiae not sulcate along outer edges; 4th hind-tarsal segment emarginate, not lobed; 5th hind-tarsal segment without obvious accessory setae; claws simple. *Secondary sexual characters* normal except last ventral abdominal segment more or less deeply notched at middle of apex in ♂, though not in ♀. *Male copulatory organs* as figured (Fig. 52).

Genotype. Maculagonum pox n. sp. (below).

Generic distribution. Mountains of New Guinea.

Notes. Of the six species of this new genus, I have seen males of only four, but the four include the extremes of generic variation in most other characters. All these males have the last ventral segment more deeply and abruptly emarginate than males of any *Altagonum* that I have been able to examine (as a rule the male last ventral is entire in *Altagonum*, but it is slightly emarginate in *scapha* and sometimes in *vallicola* and perhaps in other species). I think that this character will probably be found to hold for males of all species of *Maculagonum*. The mottling or blotching of the elytra is the most obvious character of this genus. It may be an adaptation to life in grass, tending to conceal the insects in finely divided light and shade. At least the only specimen of the genus that I have collected (the type of *altipox*) was found in a tussock on a grassy slope above timber line on Mt. Wilhelm. Some of the specimens of *Maculagonum* collected by Cheesman and Toxopeus were probably taken in light traps, for they have scales of Lepidoptera stuck to them.

Key to the Species of Maculagonum

1. Lateral margins of prothorax moderately wide; length 8.2 to 8.9 mm. . . . 2
– Lateral margins of prothorax very narrow; length 5.7 to 7.7 mm. 3
2. Elytra finely mottled with dark and pale (p. 215) . . . . . *pox*
– Elytra dark with a large common pale blotch before middle and another about ¼ from apex (p. 216) . . . . . *plagipox*
3. Anterior-lateral as well as posterior-lateral pronotal setae present; eyes small but abnormally prominent (p. 217) . . . . . *setipox*

- Anterior-lateral pronotal setae absent; eyes larger but only moderately prominent 4
4. Apices of elytra more broadly and evenly rounded; elytral microsculpture deeply impressed, isodiametric ..... *altipox*
   (4a) Darker, with dark areas of elytra more extensive and blackish or dark-brown (p. 218) ..... (*altipox s. s.*)
   (4b) Paler, with dark areas of elytra less extensive and paler brown; (see also description) (p. 219) ..... (subsp. *pallipox*)
- Apices of elytra more narrowly and abruptly rounded (lobed) about opposite 4th intervals; elytral microsculpture less deep, somewhat transverse ... 5
5. Slender, not fusiform; prothoracic width/length 1.19; 3rd elytral interval 1-punctate (p. 219) ..... *tafapox*
- Fusiform; prothoracic width/length 1.46; 3rd elytral interval 2-punctate (p. 220) ..... *scaphipox*

Maculagonum pox n. sp.

Description. With characters of genus as described above. Form (Fig. 7) somewhat *Agonum*-like, but more elongate-oval than usual in *Agonum s. s.*; more or less dark-brown, lateral margins of prothorax yellow-translucent, elytra mottled with small yellowish spots which sometimes form rows along intervals or sometimes anastomose, appendages yellowish-brown; microsculpture nearly normal but faint on head and pronotum, more distinct and only moderately transverse on elytra. *Head* .74 & .72 width prothorax; eyes large and prominent, with posterior supraocular setae about between their posterior edges; front convex, with usual slight anterior impressions and often (not always) also with an extra impression each side near eye, behind and inside of anterior supraocular seta. *Prothorax* of moderate size, much narrowed in front and moderately so behind; width/length 1.35 & 1.40; base/apex about 1.60 (angles too rounded for accurate measurement); sides nearly evenly rounded for all or most of length, sometimes more or less straight but hardly sinuate toward base; posterior angles obtuse, blunted or narrowly rounded; lateral margins moderately wide, wider toward base, only slightly reflexed; basal foveae roundish, shallow, impunctate; disc normal; anterior and posterior marginal lines light, sometimes interrupted at middle. *Elytra* rather long; basal margin rather strongly but somewhat obtusely angulate at humeri; lateral margins narrow; subapical sinuations obsolete or nearly so; apices rather strongly rounded about opposite 3rd intervals, then oblique forward and obtusely angulate or subdenticulate at suture; striae rather lightly impressed, impunctate (sometimes appearing punctate in soft specimens); intervals flat or slightly convex, 3rd 2-punctate. *Secondary sexual characters* normal except last ventral abdominal

segment of ♂ abruptly notched at middle of apex (bottom of notch would be right or slightly acute if not narrowly rounded), of ♀ entire. *Measurements:* length 8.2–8.9; width 3.1–3.3 mm.

Types. Holotype ♀ (Leiden Mus.) and 1 ♂ 3 ♀♀ paratypes (2 ♀♀ in M.C.Z. No. 28,661) from Sigi Camp, Snow Mts., **Neth. N. G.**, 1,500 m. (about 4,875 ft.), Feb. 17 (holotype), 19, & 25, 1939 (Toxopeus); and 1 ♀ paratype from Mist Camp, Snow Mts., 1,800 m. (about 5,850 ft.), Jan. 9, 1939 (Toxopeus).

Measured specimens. The ♀ holotype and ♂ paratype.

Notes. This species is sufficiently compared with others in the key, above. The single ♂ and 3 of the 4 ♀♀ paratypes are so soft that their elytra have crumpled or are at least not well formed. The copulatory organs of the ♂ are too unformed to draw.

Maculagonum plagipox n. sp.

Description. With characters of genus as described above. A little more slender than *pox*; color (of single, soft specimen) brown; lateral margins of prothorax yellow-translucent; elytra with 2 common, transversely oval, pale plagiae involving the 4 inner intervals of each elytron, centering slightly before middle of elytral length and about ¼ from apex; appendages yellow; microsculpture absent or very faint on head and pronotum, moderately transverse on elytra. *Head* .77 width prothorax; eyes large and prominent, with posterior supraocular setae about between their posterior edges; front broadly impressed each side from behind anterior supraocular seta to clypeal suture (but impressions may be due to warping of soft integument). *Prothorax* a little longer and less narrowed behind than in *pox*; width/length 1.23; base/apex about 1.63; sides rather weakly arcuate anteriorly, nearly straight and scarcely converging behind middle; posterior angles a little obtuse and rather narrowly rounded; lateral margins moderate, wider toward base, only slightly reflexed; anterior and posterior marginal lines entire. *Elytra* warped, long but apparently of nearly normal outline; basal margin obtusely subangulate at humeri; lateral margins wider than in *pox*; apices apparently formed as in *pox*; striae appear rather deeply impressed and somewhat punctate, but might be lighter and impunctate in fully hardened specimens; intervals abnormally warped in single specimen, 3rd 2-punctate. *Legs:* 4 outer segments of both hind tarsi missing, but structure presumably as in other species of genus. *Secondary sexual characters:* last ventral segment of ♂ notched as in *pox*. *Measurements:* length 8.6; width probably about 3.0 mm.

Type. Holotype ♂ (British Mus.) from Cyclops Mts., **Neth. N. G.**, 3,500 ft., Mar. 1936 (Cheesman); unique.

Measured specimen. The type.

Notes. Although this species is represented by a single soft and somewhat warped specimen, and although it is structurally fairly close to *pox*, I have no doubt it is distinct. It differs from *pox* not only in color-pattern but also in form especially of the prothorax, and in greater width of the elytral margins. I have not wanted to risk remounting the single soft specimen, which is glued to a small card, and so have been unable to examine the lower surface except from the side. Fortunately the form of the apex of the last ventral segment can be seen from above. Also, I have not risked dissecting out the genitalia, which would probably be too unformed for study in any case.

Maculagonum setipox n. sp.

Description. With characters of genus as described above. Half-fusiform, more than usually tapering anteriorly but not posteriorly; brownish-piceous with slight aeneous lustre; lateral margins of prothorax somewhat translucent posteriorly only; elytra mottled with paler brown, many of the pale marks confined to single intervals, others coalescing to form irregular blotches; appendages yellowish; microsculpture faint on head and pronotum, deeply impressed and isodiametric on elytra. *Head* .78 width prothorax; eyes rather small but abruptly prominent, with posterior supraocular setae far behind line of their posterior margins; vertex somewhat swollen; front broadly, slightly, transversely impressed between eyes, and with a long anterior impression extending from above each eye to base of clypeus. *Prothorax* broadest at extreme base; width/length 1.10; base/apex about 1.67; sides weakly arcuate anteriorly, straight and slightly diverging in posterior half; posterior angles right, well defined; base slightly lobed at middle, slightly oblique at sides to angles; lateral margins very narrow, each with a short seta before middle as well as one at basal angle; basal foveae rather shallow and poorly defined, they and adjacent areas of pronotum punctate; disc more wrinkled (transversely) than usual, otherwise normal; anterior and posterior marginal lines entire. *Elytra* with basal margin obtusely subangulate at humeri; lateral margins narrow; subapical sinuations slight; apices beyond sinuations nearly evenly, subindependently rounded to obtuse, slightly blunted sutural angles; striae shallow, vaguely punctulate; intervals flat, 3rd 2-punctate. *Secondary sexual characters:* last ventral abdominal segment of ♂ emarginate at middle of apex, with bottom of

emargination almost rectangular. *Male copulatory organs:* Fig. 52. *Measurements:* length 7.7; width 2.9 mm.

Type. Holotype ♂ (British Mus.) from Mt. Tafa, **Papua**, 8,500 ft., Feb. 1934 (Cheesman); unique.

Measured specimen. The type.

Notes. This is an exceptionally distinct species, unique within the genus in form, form of eyes, impressions of front, presence of both pairs of lateral pronotal setae, and punctation and extra wrinkling of pronotum.

Maculagonum altipox n. sp.

Description. With characters of genus as described above. Form intermediate, between normal *Agonum*-like and (anteriorly) subfusiform; dark-brown, pronotum with anterior and lateral margins narrowly and base widely yellow, the latter finely speckled with dark; elytra mottled with many small yellow spots, the larger ones very irregular in outline, forming rows along intervals, and anastomosing very little; appendages pale, except antennal segments 2 to 4 infuscate basally; microsculpture light but normal on head and pronotum, deeply impressed and isodiametric on elytra. *Head* .76 width prothorax; eyes only slightly shorter but less prominent than in *pox*, with posterior supraocular setae slightly behind line of their posterior edges; neck only slightly impressed above; front convex, with only slight and irregular anterior impressions. *Prothorax* small, widest in basal half, slightly tapering anteriorly; width/length 1.28; base/apex about 1.64; sides slightly arcuate anteriorly, almost straight and parallel in almost basal half; base broadly lobed at middle, somewhat oblique at sides; posterior angles slightly obtuse, slightly blunted; lateral margins very narrow; immediate baso-lateral areas (just inside angles) rather broadly swollen rather than depressed, not punctate, but basal area impressed each side inside of swelling; disc normal, but median line and transverse impressions slighter than usual; anterior and posterior marginal lines light, vague or interrupted at middle. *Elytra* relatively ample; basal margin obtusely angulate at humeri; lateral margins very narrow; subapical sinuations almost obsolete; apices broadly and almost conjointly rounded to obtuse sutural angles; striae light, not distinctly punctate; intervals flat or nearly so, 3rd 1-punctate. *Secondary sexual characters:* ♂ unknown; ♀ with last ventral abdominal segment broadly subtruncate, virtually entire. *Measurements:* length 7.0; width about 2.7 mm.

Type. Holotype ♀ (M.C.Z. No. 28,662) from Mt. Wilhelm, Bismarck Range, **N-E. N. G.**, over 10,000 ft. (on open grassy slope just above timber line), Oct. 1944 (Darlington).

Measured specimen. The type.

Notes. This species is sufficiently compared with others in the key to species of *Maculagonum*, above.

Maculagonum altipox pallipox n. subsp.

Description. Similar to typical *altipox* but paler, with pale spots of elytra more extensive and tending to coalesce in certain areas, especially in a common sutural blotch about ¼ from apex, and along outer margins; microsculpture as in typical *altipox*. *Head* .79 & .80 width prothorax, formed about as in *altipox*. *Prothorax* almost as in *altipox* but slightly narrowed behind; width/length 1.24 & 1.27; base/apex about 1.50 & 1.57; baso-lateral areas only slightly swollen. *Elytra* about as in *altipox* but with apices more independently, less conjointly rounded; 3rd interval similarly 1-punctate. *Secondary sexual characters:* normal; and last ventral abdominal segment of ♂ moderately emarginate at apex, the bottom of the emargination obtuse; last ventral of ♀ subtruncate. *Measurements:* length 6.9–7.2; width about 2.8 mm.

Types. Holotype ♂ (Leiden Mus.) and 1 ♀ paratype (M.C.Z. No. 28,663) both from Moss Forest Camp, Snow Mts., **Neth. N. G.**, 2,800 m. (about 9,100 ft.), Oct. 9–Nov. 5, 1938 (Toxopeus).

Measured specimens. The types.

Notes. Sufficiently compared with typical *altipox* above. The two specimens of *pallipox* are not quite fully hardened, and this may affect the intensity of the color, but not the pattern. I have dissected out the genitalia of the ♂ type, but they are not hard enough to show characters properly.

Maculagonum tafapox n. sp.

Description. With characters of genus as described above. Small and slender, almost *Europhilus*-like but more convex, with prothorax less narrowed behind and elytra more oval than usual in *Europhilus*; brown; prothorax with anterior margin less and sides and posterior margin more distinctly margined with yellow; elytra primarily yellowish with dark brown mottling especially on disc, and with dark marks coalescing to form an irregular blotch between 3rd and 7th striae about ⅓ from apex on each elytron; appendages yellowish except antennal segments 3, 4, and less distinctly 5 infuscate basally; microsculpture normal except only slightly transverse on elytra. *Head* .77 width prothorax; eyes somewhat smaller and much less prominent than in *pox*, but with posterior supraocular setae scarcely behind line

of their posterior edges; otherwise about as in *pox*. *Prothorax* small, subquadrate except rather strongly narrowed near front; width/length 1.19; base/apex about 1.46; sides only moderately arcuate anteriorly, straight and slightly converging behind middle; posterior angles slightly obtuse, blunted or very narrowly rounded; lateral margins very narrow; basal foveae poorly defined and only slightly impressed, with surface slightly swollen just inside angles; disc normal; anterior and posterior marginal lines more or less entire but not well marked. *Elytra* elongate-oval; basal margin almost rectangular at humeri; lateral margins very narrow; subapical sinuations slight; apices rather strongly lobed about opposite 4th intervals, then oblique forward to obtuse sutural angles; striae well marked but only lightly impressed, not distinctly punctate; intervals flat or nearly so, 3rd 1-punctate. *Secondary sexual characters:* ♂ unknown, ♀ with last ventral abdominal segment entire. *Measurements:* length 5.7; width 2.0 mm.

Type. Holotype ♀ (British Mus.) from Mt. Tafa, **Papua**, 8,500 ft., Feb. 1934 (Cheesman); unique.

Measured specimen. The type.

Notes. This species is sufficiently differentiated from others in the key to species of *Maculagonum*.

Maculagonum scaphipox n. sp.

Description. With characters of genus as described above. Fusiform, convex; brownish-piceous; prothorax with anterior margin faintly and lateral and posterior margins more distinctly (but not strikingly) yellowish; elytra irregularly mottled with dark and yellowish, the dark color almost solid on anterior half of disc and near apices, the yellow color predominating in a submarginal zone in about anterior ⅔ of each elytron and in a small, irregular, common sutural blotch about ¼ from apex; legs inconspicuously bicolored, femora and tibiae darker at middle than at ends; antennae yellowish with bases of several segments (especially 2nd to 4th) infuscate; microsculpture normal, but only moderately transverse on elytra. *Head* .64 width prothorax; eyes of nearly normal length but much less prominent than in *pox*, with posterior supraocular setae about between their posterior edges; neck not impressed above; front more convex than usual, with slight anterior impressions. *Prothorax* wider than usual in genus, very strongly narrowed in front, scarcely so behind; width/length 1.46; base/apex about 1.82; sides moderately arcuate for most of length, almost straight just before base; basal angles slightly obtuse, slightly blunted; lateral margins very narrow; baso-lateral areas smoothly convex near angles, but basal area impressed each side almost as near to middle as to sides;

disc normal; anterior and posterior marginal lines entire but not deeply impressed. *Elytra* with basal margin about rectangular at humeri; lateral margins very narrow; subapical sinuations slight; apices strongly lobed about opposite 4th intervals, then oblique forward to obtuse, indistinctly denticulate sutural angles; striae better impressed than usual in genus, not distinctly punctate; intervals slightly convex, 8th narrow and much more convex toward apex, 3rd 2-punctate. *Secondary sexual characters* of ♂ unknown; ♀ with last ventral abdominal segment broadly subtruncate. *Measurements:* length 6.0; width 2.3 mm.

Type. Holotype ♀ (British Mus.) from Orrori, **Papua**, 3,500 ft., July 1933 (Cheesman); unique.

Measured specimen. The type.

Notes. This may be related to the preceding (*tafapox*) but differs in many characters, of which only a few of the more obvious are noted in the key to species of *Maculagonum*.

Potamagonum new genus

Diagnosis. Based on one species, so generic and specific characters not separable, but genus characterized by large size (14–15.5 mm.); unusually long and slender appendages; wide, translucent prothoracic margin; conspicuously interrupted elytral striae; conspicuous accessory setae of 5th hind-tarsal segment; and wing-and-seta formula +w, ++, −−, +++.

Description. See that of genotype, below.

Genotype. Potamagonum diaphanum n. sp. (below).

Generic distribution. As yet known only from the Bismarck Range, N-E. New Guinea.

Notes. For comparison with other genera, see key to genera, above.

Potamagonum diaphanum n. sp.

Description. Form as figured (Fig. 8). Rather large, slender, with unusually long, slender appendages; castaneous, appendages not much paler, but tibiae paler than femora in some individuals; lateral margins of prothorax widely and conspicuously translucent; rows of pale or translucent spots along elytral striae in some individuals; shining; microsculpture of head and pronotum indistinct, of elytra light and moderately transverse. *Head* only moderately elongate (in tribe), .70 & .71 width prothorax; eyes rather large and prominent; both pairs supraocular setae present, posterior pair about between posterior edges of eyes; front normally convex, not wrinkled between eyes, impunctate,

with slight frontal impressions; neck-constriction rather deep but not sharply defined; mentum tooth triangular, somewhat blunted or rounded at apex. *Prothorax* rounded except apex emarginate and base slightly convexly subtruncate; width/length 1.27 & 1.23; base/apex not determined because of broad rounding of both anterior and posterior angles; basal foveae small, deep, not distinguishable from ends of lateral margins, impunctate; disc of pronotum normally convex, with light median line and rather deep transverse impressions, impunctate; anterior and posterior marginal lines entire, deeply impressed. *Elytra* long, subparallel or slightly narrowed anteriorly, convex; basal margin entire, obtusely angulate at humeri; lateral margins very narrow; subapical sinuations moderate (variable), broad, leading onto acute angulations or short spines about opposite 4th intervals; apices then oblique forward and more or less emarginate to denticulate sutural angles; striation entire but striae conspicuously interrupted, reduced to series of short impressed lines; intervals approximately flat but very irregular, 8th and 9th not much modified toward apex, 3rd normally but inconspicuously 3-punctate. *Inner wings* fully developed. *Lower surface* impunctate; abdomen not pubescent; prosternal process simple; metepisterna long. *Legs* normally formed but slender; hind tibiae not sulcate along outer edges; hind tarsi slender, sulcate each side above; 4th hind-tarsal segment deeply emarginate and with short lobes, outer scarcely longer than inner; 5th hind-tarsal segment with a row of conspicuous accessory setae on each side below; claws simple. *Secondary sexual characters* normal. *Male copulatory organs* as figured (Fig. 53). *Measurements:* length about 14–15.5; width about 3.5 mm. or slightly more (elytra too warped and spread for accurate measurements).

Types. Holotype ♂ (M.C.Z. No. 28,664) and 8 paratypes all from Chimbu Valley (some specimens labeled Mt. Wilhelm), Bismarck Range, **N-E. N. G.**, 5,000–7,500 & 7,000–10,000 ft., Oct. 1944 (Darlington); all taken among wet stones and in other cover on the spray-drenched banks of the turbulent Chim River at various altitudes within the limits given.

Measured specimens. The ♂ holotype and 1 ♀ paratype.

Notes. This species has perhaps been derived from a *Colpodes*-like ancestor, but it seems distinct enough to stand as a separate genus endemic to the high mountains of New Guinea.

Gastragonum new genus

Diagnosis. In most ways similar to *Notagonum* but more convex, with eyes always so reduced that posterior supraocular setae are well behind line of their posterior edges, and often with wings reduced too;

small (5.8–8.3 mm.), *Gastrellarius*- or broad *Stenolophus*- or even *Trechus*-like forms; brown or piceous, elytra sometimes slightly iridescent, appendages somewhat but usually not strikingly paler; wing-and-seta formula =w, ++, ++, +++.

Description. Form and color as described above; microsculpture variable, rarely absent. *Head* about as in *Notagonum*, except for reduction of eyes; both pairs supraocular setae always present; antennae a little shorter than usual in *Notagonum* but normally formed; frontal impressions variable; mentum tooth somewhat variable, often shorter or shorter and wider than usual in *Notagonum*. *Prothorax* usually more convex, but otherwise as in *Notagonum*, with both pairs lateral pronotal setae always present. *Elytra* also more convex than usual but otherwise within common range of variation of *Notagonum*; apices always simple, with sutural angles not denticulate; outer intervals never much modified toward apex; 3rd interval always normally 3-punctate. *Inner wings* full, dimorphic, or vestigial. *Lower surface* as usual in *Notagonum*, not or only locally and slightly punctate; abdomen rarely pubescent, usually not; prosternal process simple; metepisterna variable, shortened in some species with reduced wings. *Legs* as in *Notagonum*; hind tarsi moderately slender, slightly or not distinctly sulcate at sides above; 4th hind-tarsal segment different in different species; 5th hind-tarsal segment without obvious accessory setae; claws simple. *Secondary sexual characters* as in *Notagonum* (normal). *Male copulatory organs* simply agonine (Figs. 54–56).

Genotype. Gastragonum terrestre n. sp. (below).

Generic distribution. Mountains of New Guinea, probably mostly in unforested areas.

Notes. This genus is presumably derived from *Notagonum*. Its obvious adaptations (reduction of eyes, atrophy of wings in some species, and associated structural changes) are those which occur most often among ground-living mesophile Carabidae in temperate areas. The only species of *Gastragonum* which I have myself collected in any numbers (*terrestre*) was common under stones, and under strawberry plants in a missionary garden, in open country, not in forest, and always away from water. I found no other agonine in this situation. The several species of *Gastragonum*, perhaps excepting *laevisculptum*, apparently form a natural mesophile group which may be more or less confined to open areas of the mountains of New Guinea. This would account for the small number of specimens secured by Cheesman and Toxopeus, and so for the unfortunate number of uniques described below. These collectors apparently worked chiefly in forest (which, as experienced collectors well know, is the richest environment in New Guinea) or along brooks, and took many of their Carabidae with light

traps, which would hardly catch at least the flightless species of *Gastragonum*.

Key to the Species of Gastragonum

1. Whole upper surface polished, without reticulate microsculpture; elytral striae strongly punctate (p. 224) ..... *laevisculptum*
- Microsculpture present; elytral striae not punctate 2
2. Prothorax more broadly rounded, with sides relatively widely margined and not sinuate before base; (relatively weak frontal impressions distinguish this from all following species except *trechoides*) (p. 225) ... *subrotundum*
- Prothorax less broadly rounded, often subcordate, with sides more narrowly margined and more or less sinuate before base 3
3. Sides of prothorax strongly sinuate before base; (frontal impressions rather deep, short-linear but not punctiform) 4
- Sides of prothorax weakly sinuate 5
4. Elytra not transversely impressed before middle; form a little broader; sides of prothorax more abruptly sinuate before base (p. 226) ..... *terrestre*
- Elytra transversely impressed before middle; form a little more slender; sides of prothorax more broadly sinuate before base (p. 227) .. *terrestroides*
5. Elytra normal, subquadrate; frontal impressions very small, deep, punctiform (p. 227) ..... *frontepunctum*
- Elytra oval; frontal impressions shallow, poorly defined (p. 228) .. *trechoides*

Gastragonum laevisculptum n. sp.

Description. With essential characters of genus as described above. Larger, broader, and less convex than usual (in genus); piceous-brown, appendages paler brown; upper surface polished, without detectable microsculpture (at 54×) but finely sparsely punctulate. *Head* .70 width prothorax; eyes small but abruptly prominent; genae about long as eyes, very oblique, convex in profile; front irregular, with moderate anterior impressions. *Prothorax* rather large; width/length 1.41; base/apex 1.26; anterior angles rather prominent, moderately rounded; sides weakly arcuate, vaguely subangulate at anterior-lateral setae, broadly but not strongly sinuate before nearly right, only slightly blunted posterior angles; lateral margins wide (in genus), moderately reflexed toward base; basal foveae moderate, irregular but scarcely punctate; disc normal; anterior and posterior marginal lines more or less entire but not deeply impressed. *Elytra* moderately wide, subparallel at middle, relatively convex compared with prothorax, not impressed; basal margin rounded and more than usually elevated at humeri; lateral margins rather wide (in genus); striae moderately impressed, rather strongly punctate; intervals convex. *Lower surface* impunctate except abdomen with some fine sparse punctation and

inconspicuous pubescence. *Inner wings* vestigial; metepisterna shortened, not much more than ½ longer than wide. *Legs:* 4th hind-tarsal segment rather shallowly emarginate. *Male copulatory organs:* Fig. 54. *Measurements:* length 8.3; width about 3.4 mm.

Type. Holotype ♂ (Leiden Mus.) from Letterbox Camp, Snow Mts., **Neth. N. G.**, 3,600 m. (about 11,700 ft.), Sept. 1–12, 1938 (Toxopeus); unique.

Measured specimen. The type.

Notes. Although this interesting species has the technical characters of *Gastragonum*, I am not sure that it is really related to the other members of the genus. It may be independently derived, presumably from *Notagonum*. The characters which set this species apart from the others are general form, abruptly prominent "popped" eyes, absence of reticulate microsculpture, slight elevation of basal margin of elytra at humeri, punctation of elytral striae, pubescence of abdomen, and form of 4th hind-tarsal segment. I know of no species of any genus to which the present one is closely similar.

Gastragonum subrotundum n. sp.

Description. With characters of genus as described above. Form of convex *Stenolophus*; piceous, more or less iridescent (varying in different lights), appendages brown, lateral margins of prothorax moderately translucent-brown; microsculpture light and isodiametric on head, very light, fine and transverse on pronotum and elytra. *Head* .62 & .64 width prothorax; eyes small, moderately prominent; genae nearly as long as eyes, oblique, straight or slightly convex in profile; front strongly convex, frontal impressions slight; mentum tooth a little smaller than usual, triangular. *Prothorax* rounded-transverse; width/length 1.38 & 1.29; base/apex 1.30 & 1.33 (base measured at posterior-lateral setae); anterior angles only normally prominent, rather narrowly rounded; sides broadly arcuate through all or much of length, not sinuate posteriorly; posterior angles completely and broadly rounded out (♂ from Bismarck Range) or merely very obtuse (♀ from Snow Mts.); lateral margins moderate, wider basally, moderately reflexed; basal foveae rather small, scarcely punctate; disc normal; anterior and posterior marginal lines fine but entire. *Elytra* subquadrate, moderately elongate, rather strongly convex, slightly or scarcely impressed before middle; basal margin not or vaguely angulate at humeri; lateral margins rather narrow; striae moderately impressed, impunctate. *Lower surface* virtually impunctate; abdomen not pubescent. *Inner wings* fully developed in both specimens; metepisterna long. *Legs:* 4th hind-tarsal segment with rather short outer and still shorter inner

lobe. *Male copulatory organs:* Fig. 55. *Measurements:* of ♂ from Bismarck Range, 6.6 by about 2.5; of ♀ from Snow Mts., 8.0 by about 3.0 mm.

Types. Holotype ♂ (M.C.Z. No. 28,665) from Chimbu Valley, Bismarck Range, **N-E. N. G.**, 5,000–7,500 ft., Oct. 1944 (Darlington), from an unrecorded habitat but not in forest; and 1 ♀ paratype from Ibele (Iebele) Camp, Snow Mts., **Neth. N. G.**, 2,250 m. (about 7,325 ft.), Nov. 1938 (Toxopeus).

Measured specimens. The types.

Notes. This species is sufficiently distinguished from others in the key to species of *Gastragonum*, above. The Snow Mts. specimen is larger than the type, with relatively narrower prothorax with evident, though very obtuse, posterior angles. If these differences prove to hold in series, they should be of at least subspecific value.

Gastragonum terrestre n. sp.

Description. With characters of genus as described above. Form (Fig. 9) of *Gastrellarius* (subgenus of *Pterostichus*); brownish-piceous, not distinctly iridescent, appendages yellowish-brown, lateral margins of prothorax moderately translucent-brown; microsculpture light and isodiametric on front (more distinct on occiput), very light and moderately transverse on disc of pronotum, more distinct (but still light) and moderately transverse on elytra. *Head* .65 & .64 width prothorax; eyes small but rather prominent; genae shorter than eyes, oblique; front strongly convex, with deep, short, linear frontal impressions extending onto clypeus; mentum tooth shorter than usual in *Notagonum*. *Prothorax* quadrate-subcordate; width/length 1.27 & 1.26; base/apex also 1.27 & 1.26; sides arcuate for much of length, strongly sinuate near base; basal angles approximately right, not blunted; lateral margins average (in genus); basal foveae moderate, poorly defined, more or less extensively punctate especially toward disc; disc normal; anterior and posterior marginal lines entire. *Elytra* subquadrate, of normal outline, rather strongly convex, not impressed on disc; basal margin not or slightly subangulate at humeri; lateral margins rather narrow; striae rather deeply impressed, irregular but not distinctly punctate. *Lower surface* sometimes with a few punctures at sides of mesosternum; abdomen not pubescent. *Inner wings* dimorphic, vestigial in 17 specimens (including type), fully developed in 2 specimens with same data; metepisterna rather long but a little variable, longest in the fully winged specimens. *Legs:* 4th hind-tarsal segment lobed but outer lobe short and inner one even a little shorter. *Male copu-*

latory organs as figured (Fig. 56). *Measurements:* length 6.2–6.9; width about 2.4–2.6 mm.

Types. Holotype ♂ (M.C.Z. No. 28,666) and 18 paratypes all from Chimbu Valley, Bismarck Range, **N-E. N. G.**, 5,000–7,500 ft., Oct. 1944 (Darlington).

Measured specimens. The ♂ holotype and 1 ♀ paratype.

Notes. This species is adequately compared with others in the key to species of *Gastragonum*. Its habitat is described in notes under the genus.

Gastragonum terrestroides n. sp.

Description. Very close to *terrestre* and answering to the same description (see above) except in details given below. Larger and a little more elongate than *terrestre*; color same, but elytra faintly iridescent in some lights, with elytral microsculpture finer. *Head* .70 & .64 width prothorax. *Prothorax:* width/length 1.20 & 1.22 (narrower than in *terrestre*); base/apex 1.28 & 1.32; sides a little more broadly but still strongly sinuate before base. *Elytra* a little more elongate and with basal margin more distinctly angulate at humeri than in *terrestre*, and with disc distinctly impressed before middle in all (4) specimens. *Inner wings* fully developed in all specimens. Other characters as in *terrestre* (except male copulatory organs not compared). *Measurements:* length about 7.2–7.6; width slightly under 3.0 mm.

Types. Holotype ♂ (Leiden Mus.) and 1 broken ♂ paratype (M.C.Z. No. 28,667) from Ibele (Iebele) Camp, Snow Mts., **Neth. N. G.**, 2,250 m. (about 7,325 ft.), Nov.–Dec. 1938 (Toxopeus); 1 ♀ paratype from Moss Forest Camp, Snow Mts., 2,800 m. (about 9,100 ft.), Oct. 9–Nov. 5, 1938 (Toxopeus); and 1 ♀ paratype from Mt. Misim, Morobe Dist., **N-E. N. G.** (Stevens, M.C.Z.).

Measured specimens. The ♂ holotype and ♀ paratype from the Snow Mts.

Notes. This is so close to *terrestre* that, if it occurred only on the Snow Mts., I should probably consider it a subspecies, but its occurrence also on Mt. Misim has led me to treat *terrestroides* as a full species at least for the time being.

Gastragonum frontepunctum n. sp.

Description. With characters of genus as described above. Similar to *terrestre* (of which see description, above) but differing in the following details. Similar to *terrestre* in form (except as noted below), color, and microsculpture. *Head* .65 width prothorax; eyes larger but less

prominent than in *terrestre*, with genae short and oblique; frontal impressions very small but deep, round, punctiform, just behind clypeal suture. *Prothorax:* width/length 1.28; base/apex 1.20 (base relatively narrower than in *terrestre*); sides much less sinuate than in *terrestre*; basal angles obtuse, somewhat blunted. *Elytra, lower surface,* etc. about as in *terrestre*. *Inner wings* vestigial in single specimen, but metepisterna not much shortened. *Measurements:* length 6.7; width about 2.4 mm.

Type. Holotype ♀ (British Mus.) from Mt. Tafa, **Papua**, 8,500 ft., Feb. 1934 (Cheesman); unique. It is unfortunately somewhat crushed and broken, but the essential characters are not affected.

Measured specimen. The type.

Notes. The form of the frontal impressions is of course the outstanding character of this species.

Gastragonum trechoides n. sp.

Description. With characters of genus as described above. Very small; form of a convex *Trechus*; color and microsculpture as in *terrestre* (see above). *Head* .65 width prothorax; eyes relatively larger than in *terrestre* but much less prominent; genae very short, oblique; frontal sulci slight. *Prothorax* rather small (in genus); width/length 1.24; base/apex 1.23; sides rather gently arcuate for most of length, slightly sinuate before base; basal angles obtuse, moderately rounded; lateral margins rather narrow, a little wider toward base, moderately reflexed; basal foveae moderate, not distinctly punctate; disc normal; anterior and posterior marginal lines entire. *Elytra* suboval, a little more narrowed in front than behind; basal margin obtusely but distinctly angulate at humeri; striae moderately impressed, not punctate; other details normal for genus. *Lower surface* virtually impunctate; abdomen not pubescent. *Inner wings* vestigial; metepisterna a little shortened. *Legs:* 4th hind-tarsal segment as in *terrestre*. *Measurements:* length 5.8; width 2.3 mm.

Type. Holotype ♀ (Leiden Mus.) from Baliem Camp, Snow Mts., **Neth. N. G.**, 1,700 m. (about 5,525 ft.), Nov. 16–27, 1938 (Toxopeus); unique.

Measured specimen. The type.

Notes. A distinct little species, sufficiently defined within the genus in the key to species of *Gastragonum*.

IDIAGONUM new genus

Diagnosis. Rather large (12.9–15.3 mm.), usually dull, black or brown, mountain-living forms, with wings vestigial, elytra with basal margin incomplete and with a partial extra (10th) interval, prosternal process setose, and wing-and-seta formula −w, ++, ++, −−−.

Description. Idiastes-like (Fig. 10); size and color as given above; microsculpture variable. *Head* large, more or less oval, with moderate or deep neck constriction; eyes very small but abruptly prominent, well separated from mouth below; both pairs supraocular setae present, anterior ones a little above anterior edges of eyes, posterior ones far behind and above eyes; antennae normal, with 3rd segment longer than 4th and 2 or more times long as 2nd; front very broadly, a little irregularly convex, slightly impressed each side anteriorly; mentum with a strong, triangular tooth, sometimes narrowly truncate at apex; ligula broad, bisetose; paraglossae slender, a little longer than ligula, free and bent inward toward apex; palpi slender, labial ones with 2nd segment bisetose. *Prothorax* more or less subcordate; anterior angles moderate or very prominent anteriorly; both pairs of lateral pronotal setae present, anterior ones at or a little before middle, posterior ones at basal angles. *Elytra* with basal margin absent inwardly, ending near bases of 4th striae, more or less angulate and prominent anteriorly at humeri; apices simple or nearly so; usual 9 intervals present and also a partial 10th one between 9th and margin posteriorly, outer intervals not much modified toward apex, 3rd without dorsal punctures; a slight longitudinal fold inside each elytron near outer edge, not reaching margin. *Inner wings* vestigial; metepisterna (without epimera a little longer than wide. *Lower surface* at most vaguely punctate; abdomen not pubescent; prosternal process with tip not margined but with conspicuous setae. *Legs* normally formed; hind tibiae not sulcate along outer edges; hind tarsi rather slender, lightly sulcate each side above; 4th hind-tarsal segment rather deeply emarginate but not or very briefly lobed; 5th hind-tarsal segment without obvious accessory setae; claws simple; sole of first 4 hind-tarsal segments rather densely setose each side below but with middle of sole narrowly bare. *Secondary sexual characters* normal except ♂ front tarsi less dilated than usual. *Male copulatory organs* as figured (Fig. 57).

Genotype. Idiagonum asperum n. sp. (below).

Generic distribution. At present known only from the Bismarck and Snow Mt. Ranges of New Guinea.

Notes. This new genus is superficially rather similar to *Idiastes* Andrewes of Mt. Kinabalu, Borneo, but it differs from *Idiastes* in the following notable characters: all normal supraocular and lateral pronotal setae present, basal margins of elytra incomplete, partial 10th

elytral interval present, and prosternal process with setae. No one o these characters is necessarily very important, but together they sug gest that *Idiagonum* is not directly related to *Idiastes* but has been independently derived perhaps from a *Colpodes*-like ancestor in the mountains of New Guinea. One of the alticoline *Colpodes* of New Guinea (*acuticauda*, described above) has some of the expected characteristics of such an ancestor. I should add that I have examined at the British Museum a dissected cotype of *Idiastes alaticollis* Andr. and that as a result I feel sure that *Idiastes* should go in the Agonini near *Colpodes*, not in the Pterostichini where Andrewes put it. The inner costa of the elytron does not reach the margin and is not really like that of a true pterostichine, and the male copulatory organs are agonine.

The partial extra (10th) elytral interval occurs in all specimens of all species of *Idiagonum*. A smaller or less well defined rudimentary 10th interval occurs also in some *Fortagonum* (below), but this is probably an example of parallelism rather than an indication of relationship.

Key to the Species of Idiagonum

1. Pronotum not transversely wrinkled (p. 230) ..... *inasperum*
– Pronotal disc densely and extensively transversely wrinkled 2
2. Base of pronotum subequal to or narrower than apex, not distinctly margined (p. 231) ..... *asperum*
– Base of pronotum slightly wider than apex, margined 3
3. Eyes, though small and abruptly prominent, forming only very obtuse angles with genae in profile from above; pronotum with many shallow transverse wrinkles, very finely longitudinally rugulose near both anterior and posterior margins; posterior marginal bead below level of surface of base of pronotum (p. 232) ..... *muscorum*
– Eyes more abruptly prominent, forming conspicuous though still somewhat obtuse angles with genae; pronotum with fewer but deeper transverse wrinkles, more coarsely longitudinally rugulose near anterior margin but not distinctly rugulose near posterior margin; posterior marginal bead not below level of surface of base of pronotum (p. 232) ..... *asperior*

IDIAGONUM INASPERUM n. sp.

Description. With characters of genus as described above, but more shining than usual, without transverse wrinkling of pronotum. Piceous-black or brownish-piceous (immature); moderately shining, not iridescent; upper surface finely and sparsely punctate and with reticulate microsculpture light and isodiametric on front of head, fine and transverse on pronotum, coarser and variable on elytra (♀) (nearly isodiametric on disc anteriorly, more transverse laterally and

apically). *Head* .76 & .74 width prothorax; some transverse wrinkling behind and below eyes; mentum tooth truncate at apex. *Prothorax* rather large (in genus); width/length 1.28 & 1.25; base/apex 1.10 & 1.12; anterior angles moderately prominent; sides arcuate through much of length, not angulate at lateral setae, broadly sinuate before obtuse but nearly right and well formed basal angles; lateral margins moderately wide, reflexed; basal foveae poorly defined, shallow, impunctate, separated from margins by slight swellings (or they could be described as broad and deep, reaching margins, with bottoms slightly swollen); disc moderately convex; anterior and posterior marginal lines entire. *Elytra* slightly narrowed toward base, moderately convex; subapical sinuations absent or nearly so; apices simple, almost conjointly rounded, but sutural angles independently narrowly rounded; striae rather deep, impunctate; intervals moderately convex. *Measurements:* length 12.9–13.4; width 4.6–4.8 mm.

Types. Holotype ♀ (Leiden Mus.) and 1 ♀ paratype (M.C.Z. No. 28,668) both from Moss Forest Camp, Snow Mts., **Neth. N. G.**, 2,600–2,800 m. (about 8,450–9,100 ft.), Oct. 9–Nov. 5, 1938 (Toxopeus)

Measured specimens. The types.

Notes. This species is sufficiently distinguished from others in the key, above. The paratype has a few *longitudinal* wrinkles on head and pronotum which are, I think, due to warping of the surface. The specimen is slightly immature.

Idiagonum asperum n. sp.

Description. With characters of genus as described above. Form as figured (Fig. 10). Rather dull black, legs and antennal bases piceous, outer segments of antennae brown; microsculpture of head fine but deeply impressed, isodiametric; that of pronotum fine, transverse; that of elytra apparently still finer and transverse but scarcely visible at 54×. *Head* .75 & .70 width prothorax; front with fine sparse punctulation as well as microreticulation and a little irregular wrinkling; much transverse wrinkling behind and below eyes; mentum tooth bluntly pointed. *Prothorax* subcordate; width/length 1.16 & 1.21; base/apex .98 & .98 (& .92); anterior angles moderately prominent; sides irregularly arcuate or nearly straight (and converging) anteriorly, angulate at anterior-lateral setae, then strongly converging posteriorly and strongly sinuate well before basal angles; latter right, accurately defined; lateral margins rather wide, reflexed; basal foveae deep, not punctate; disc strongly transversely rugulose, impunctate; apical and basal marginal areas longitudinally rugulose; anterior marginal line entire, posterior one vague or absent. *Elytra* distinctly narrowed

toward base and rather strongly convex; subapical sinuations nearly absent; apices conjointly rounded except sutural angles slightly divergent and slightly produced (slightly variable); striae deep, not or slightly punctulate; intervals convex, with at most extremely fine, sparse, inconspicuous punctulation. *Male copulatory organs* as figured (Fig. 57). *Measurements:* length 13.8–15.3; width 4.7–5.2 mm.

Types. Holotype ♂ (M.C.Z. No. 28,669) and 12 paratypes all from Mt. Wilhelm, Bismarck Range, **N-E. N. G.**, 7,000–10,000 ft., Oct. 1944 (Darlington), taken under various cover on the ground in heavy forest.

Measured specimens. The ♂ holotype and 1 ♀ paratype (and in parentheses prothoracic base/apex ratio of another ♀).

Notes. Sufficiently compared with other species in the key above, and in the descriptions of the two following species.

Idiagonum muscorum n. sp.

Description. With characters of genus as described above. Color and sculpture of *asperum* (of which see description, above) and form nearly similar, but broader, with elytra less narrowed anteriorly. *Head* .70 & .70 width prothorax, like that of *asperum* in all characters given. *Prothorax:* width/length 1.30 & 1.31; base/apex 1.08 & 1.10; anterior angles more prominent than in *asperum*; sides more evenly arcuate anteriorly, less angulate at anterior-lateral setae, and less strongly sinuate posteriorly, with posterior angles on the obtuse side of right; basal foveae and disc about as in *asperum*; posterior as well as anterior marginal line distinct, and posterior margin slightly below level of surface of base of pronotum. *Elytra* relatively broader (especially anteriorly) than in *asperum*; otherwise about same except sutural angles narrowly rounded or simply angulate, usually less prominent than in *asperum*. *Measurements:* length 13.4–15.2; width 4.9–5.4 mm.

Types. Holotype ♂ (Leiden Mus.) and 5 paratypes (2 in M.C.Z. No. 28,670) all from Moss Forest Camp, Snow Mts., **Neth. N. G.**, 2,600–2,800 m. (about 8,450–9,100 ft.), Oct. 9–Nov. 5, 1938 (Toxopeus)

Measured specimens. The ♂ holotype and 1 ♀ paratype.

Notes. This is sufficiently compared with *asperum* above, and with other species in the key.

Idiagonum asperior n. sp.

Description. With characters of genus as described above. Color of the two preceding species (*asperum* and *muscorum*); form intermediate

between the two. *Head* .72 & .74 width prothorax; eyes much more abruptly prominent than in the other species; sides of front irregularly flattened or depressed; neck-constriction deeper; mentum tooth bluntly pointed; sculpture of head about as in *asperum*. *Prothorax:* width/length 1.38 & 1.32; base/apex 1.09 & 1.07; anterior angles very prominent, making prothorax appear longer than measurements above suggest; sides angulate at anterior setae, rather broadly, moderately sinuate before basal angles; latter slightly obtuse or nearly right, very well defined; basal foveae deep and simple, as in *asperum*; disc with fewer but deeper transverse wrinkles than in *asperum* or *muscorum* and with some fine sparse punctulation, coarsely longitudinally rugulose near apex, irregular but not distinctly rugulose near base; posterior as well as anterior marginal line distinct, posterior margin on same level as surface of base of pronotum. *Elytra* with apices simple, broadly conjointly rounded (as in other species) and with sutural angles narrowly rounded; striae and intervals about as in preceding species but intervals a little more plainly though still finely and sparsely punctulate. *Measurements:* length 13.1–13.8; width 4.9–5.3 mm.

Types. Holotype ♂ (Leiden Mus.) and 4 paratypes (2 in M.C.Z. No. 28,671) from Moss Forest Camp, Snow Mts., **Neth. N. G.**, 2,600–2,800 m. (about 8,450–9,100 ft.), Oct. 9–Nov. 5, 1938; and 1 paratype from Top Camp, Snow Mts., 2,100 m. (about 6,825 ft.), Jan. 29, 1939 (all collected by Toxopeus).

Measured specimens. The ♂ holotype and 1 ♀ paratype from Moss Forest Camp.

Notes. It is surprising to find a second rugulose species of this genus with exactly the same data as *muscorum*. Possibly the two occur in different forest tracts, or are otherwise separated. It is conceivable that the two are forms of one dimorphic species, but this seems to me unlikely. Each is represented by several specimens and each is uniformly characterized by several seemingly independent structural details.

MONTAGONUM new genus

Diagnosis. Based on one species, so generic and specific characters not separable, but genus characterized by convex *Calathus*-like form, atrophied wings, wing-and-seta formula −w, ++, −+, +++ (but single punctures of 3rd elytral interval sometimes missing) with posterior-lateral pronotal setae on flat surface of margins well before basal angles, absence of obvious accessory setae on 5th hind-tarsal segment, etc.

Description. See that of single species, below.

Genotype. Montagonum toxopeanum n. sp., below.

Generic distribution. At present known only from one locality at a high altitude (at or slightly above timber line) on the Snow Mountains of Netherlands New Guinea.

Notes. In atrophied wings and to some extent in appearance this new genus resembles certain *Nebriagonum* (below), but this is probably a result of similar adaptation to a similar habitat rather than an indication of relationship. The pattern of standard setae is different from any *Nebriagonum.* The position of the posterior-lateral pronotal setae, on the flat surface of the margins, is somewhat like the position of these setae in certain *Altagonum* (*latilimbus, paralimbus, scapha*), although in the latter the setae are not so far forward. I suspect that *Montagonum* has been derived independently from an *Altagonum* by atrophy of wings and other appropriate changes.

Montagonum toxopeanum n. sp.

Description. Convex *Calathus*-like (Fig. 11); piceous-black, appendages dark-reddish, lateral margins of prothorax and elytra faintly if at all translucent; upper surface impunctate, moderately shining, not iridescent; microsculpture normal, very distinct. *Head* rather small, .57 & .57 width prothorax; eyes reduced in size but more prominent than usual; genae about as long as eyes, oblique; both pairs of supraocular setae present, posterior ones well behind line of posterior edges of eyes; antennae rather short, normal in structure; neck not impressed above; front irregularly convex, with slight frontal impressions; mentum tooth triangular. *Prothorax* rather long, widest near middle, rather strongly narrowed in front, moderately so behind; width/length 1.13 & 1.11; base/apex 1.41 & 1.50; anterior angles moderately advanced, rounded-acute; sides weakly arcuate for much of length, more or less straight (and converging) or even faintly sinuate toward base; basal angles a little obtuse and rather narrowly rounded; lateral margins very narrow anteriorly, broader but very poorly defined posteriorly; anterior-lateral setae absent, posterior-lateral ones on flat margins just inside of thickened marginal beads about $\frac{1}{6}$ of prothoracic length before apparent basal angles; basal foveae very shallow and poorly defined, sometimes with a slight swelling at middle, not punctate; disc convex, with light median line, and with transverse impressions scarcely indicated; anterior marginal line entire, posterior one faint or broadly interrupted at middle. *Elytra* with sides more rounded and disc more convex than usual in tribe; disc not impressed; anterior margin entire, about rectangular at humeri; lateral margins moderate; subapical sinuations absent, sides curving smoothly almost to suture, so apices almost conjointly rounded; sutural angles narrowly rounded,

slightly dehiscent but not produced, not denticulate; striae moderately impressed, not punctate; intervals slightly convex, 8th and 9th not much modified toward apex, 3rd normally 3-punctate except punctures somewhat variable in anterior-posterior spacing, and single punctures sometimes missing (left anterior puncture missing in type, right posterior one missing in 2nd measured specimen). *Inner wings* vestigial; metepisterna slightly shortened. *Lower surface* impunctate; abdomen not pubescent; prosternal process simple. *Legs:* 4th hind-tarsal segment simply emarginate; 5th hind-tarsal segment with apparent vestigial but usually not obvious accessory setae (type has 1 obvious seta on outer-lower edge of right 5th hind-tarsal segment about middle of its length). *Secondary sexual characters* normal. *Male copulatory organs* as figured (Fig. 58). *Measurements:* length 8.7–9.3; width 3.2–3.5 mm.

Types. Holotype ♂ (Leiden Mus.) and 5 paratypes (2 in M.C.Z. No. 28,672) all from Letterbox Camp, Snow Mts., **Neth. N. G.**, 3,600 m. (about 11,700 ft.), Sept. 1–12, 1938 (Toxopeus).

Measured specimens. The ♂ holotype and 1 ♀ paratype.

Notes. The possible relationships of this species are discussed under the genus.

I take great pleasure in naming this distinct and interesting high-altitude form for Mr. L. J. Toxopeus, who obtained the types and so many other fine Carabidae on the Snow Mts. of New Guinea. I have used the name *toxopeanum* rather than *toxopei* because the latter has been employed by Andrewes for a species of *Colpodes* from Buru.

Nebriagonum new genus

Diagnosis. Within the New Guinean agonine complex this genus is most simply characterized by atrophied wings plus *either* a very large head (.90 or more width prothorax) *or* presence of obvious accessory setae on the 5th hind-tarsal segment. Additional noteworthy generic characters are eyes small; head with distinct but variable neck-constriction; prothorax small or moderate in size and usually rather elongate; elytra more or less oval, with dorsal punctures irregular or absent. The wing-and-seta formula is confusingly variable: —w, (+)+, (−) (−), (−) (−) (−). Some of the species have rather the appearance of large-headed, convex species of *Nebria* with oval elytra. The size-range is from 7.7 to 14.3 mm.

Description. Form variable; black or brownish with appendages not much paler; upper surface only moderately shining, not or (*transitior*) faintly metallic, not iridescent; upper surface including pronotal foveae virtually impunctate; microsculpture always distinct, about isodiametric on head, more or less transverse (sometimes only slightly so)

on pronotum and elytra. *Head* moderate to very large; eyes rather small, variable in form; both pairs supraocular setae present except anterior pair usually absent in *percephalum*; posterior pair slightly or much behind line of posterior edges of eyes; neck-constriction always present, but variable, sometimes only slightly impressed above; anterior frontal impressions moderate, irregular; front often impressed also between eyes, the impressions often being 4 in number and forming a rectangle narrowest anteriorly; antennae normal, varying in length; mentum tooth triangular with apex variable (pointed, blunted, or slightly emarginate). *Prothorax* rather narrow but variable in form; lateral pronotal setae present only in *cephalum*, absent in other species; basal foveae moderate or small, not sharply defined; disc more or less strongly convex, with usual middle line and transverse impressions more or less lightly impressed; anterior marginal line entire, posterior one also usually entire but less impressed. *Elytra* more or less oval, usually strongly convex; basal margin entire, differently subangulate or angulate at humeri in different species; subapical sinuations absent or nearly so; apices usually simply and more or less independently rounded, rarely (*arboreum*) each with a very short spine; striae deeply to very lightly impressed in different species, not or (*arboreum*) faintly punctulate; 8th and 9th intervals not much modified toward apex; 3rd interval with or without (irregular) dorsal punctures. *Lower surface* impunctate or nearly so; abdomen not pubescent; prosternal process simple. *Inner wings* vestigial; metepisterna more or less shortened. *Legs* normally formed; hind tibiae not sulcate along outer edges; hind tarsi slender, not or only slightly sulcate at sides above; 4th hind-tarsal segment simply emarginate in *subcephalum*, lobed in other species, with outer lobe longer than inner; 5th hind-tarsal segment with or without obvious accessory setae in different species. *Secondary sexual characters* normal. *Male copulatory organs* as figured (Figs. 59 & 60).

Genotype. *Nebriagonum cephalum* n. sp. (below).

Generic distribution. At present known only from 5 species from the Bismarck Range and 1 from the Snow Mountains, New Guinea.

Notes. Although there is extraordinary variation in some characters in this new genus, I am convinced that it is a natural one, except perhaps for *N. subcephalum* which is somewhat isolated in structure (see notes under its description) as well as geographically. The 5 species from the Bismarck Range form a remarkable and nearly continuous series. *N. cephalum* has all normal supraocular and lateral pronotal setae except that one or both posterior-lateral pronotal setae are missing in a few individuals; it has some (irregular) dorsal punctures on the 3rd elytral intervals; and the 5th hind-tarsal segment lacks

obvious accessory setae. *N. percephalum* is superficially very similar, differing only slightly in details of form, depth of elytral striae, etc., but has lost the anterior supraocular setae (except that the anterior one is present on one side in one individual), both pairs of pronotal setae, and all dorsal punctures of the 3rd elytral intervals; (the 5th hind-tarsal segment is without obvious accessory setae, as in *cephalum*). *N. transitum* too is not very different from *cephalum* superficially (the prothorax is more rounded but still with narrow margins, the elytra are less deeply striate, etc.), but it has lost both pairs of lateral pronotal setae and most of the dorsal punctures of the 3rd elytral intervals (it has both pairs of supraoculars), and it has a few (usually 2 or 3 on each side) small but distinct accessory setae on the 5th hind-tarsal segment. *N. transitior* in turn is not very different from *transitum*, with elytral apices still simple, but it has wider prothoracic margins and better developed accessory setae on the 5th hind-tarsal segment, and it has completely lost all dorsal punctures of the 3rd elytral intervals. Finally, *arboreum* is not very different from *transitior*, but is larger, with short-spined elytral apices, and different in other details, including retention of at least the posterior puncture of the 3rd elytral interval. These 5 species form an interesting sequence in habits, too. *N. cephalum* and *percephalum* are hydrophiles which occur primarily by rapid mountain brooks in and above the highest forest on Mt. Wilhelm, and *cephalum* occurs also in seepage areas up to about 14,000 ft., the highest altitude at which I found any Carabidae on the mountain. *N. transitum* is a mesophile which is common on the ground under cover away from water, chiefly in open, grassy country above timber line. *N. transitior* is another ground-living mesophile, but my 6 specimens of it were all found in forest. And *N. arboreum* is apparently arboreal; both my specimens of it were found above the ground, one in the thatch of an old shelter. I do not mean to imply that these 5 species form a simple linear series. Their relationships are probably complex. But I do feel sure that they represent one stock which has radiated on the Bismarck Range, or at least in a limited area in the mountains of New Guinea. These species are now isolated from each other at least partly by ecological factors, but it would be unwise to assume that they have evolved in their present positions as a result of ecological isolation. They are very distinct species and they may have had complex histories (*cf.* "Role of geographical isolation" in the introduction, above).

Key to the Species of Nebriagonum

1. Fourth hind-tarsal segment emarginate, not lobed; (see also notes under species) (Snow Mts.) (p. 238) ..... *subcephalum*

– Fourth hind-tarsal segment lobed, outer lobe longer than inner (Bismarck Range) 2
2. Head very large, about .90 or more width prothorax; 5th hind-tarsal segment without obvious accessory setae 3
– Head relatively narrower; 5th hind-tarsal segment with obvious accessory setae 4
3. Both pairs (or sometimes only anterior pair) of lateral pronotal setae, both pairs of supraocular setae, and some punctures of 3rd elytral intervals present (p. 239) ..... *cephalum*
– Both pairs of lateral prothoracic setae, anterior supraoculars (usually), and all punctures of 3rd elytral intervals absent (p. 240) ..... *percephalum*
4. Prothorax narrowly margined; length 8.4–10.3 mm. (p. 241) ..... *transitum*
– Prothorax more widely margined; size larger 5
5. Elytral apices simple; length 11.3–11.9 mm. (p. 241) ..... *transitior*
– Elytral apices each with a short spine; length 12.9–14.3 mm. (p. 242) ..... *arboreum*

Nebriagonum subcephalum n. sp.

Description. With main characters of genus as described above, but exceptional in several details. Form more normally agonine than in other *Nebriagonum*, with head narrower, prothorax less modified, and elytra less oval. *Head* .73 & .76 width prothorax; eyes small, only moderately prominent; genae about as long as eyes, slightly convex in profile; both pairs supraocular setae present; neck constriction vague, shallow; front only slightly impressed behind usual anterior impressions. *Prothorax* of moderate size, only moderately elongate; width/length 1.09 & 1.08; base/apex 1.18 & 1.21; anterior angles only slightly prominent; sides broadly, not strongly arcuate, then slightly or moderately sinuate before well formed, nearly right, only slightly blunted posterior angles; lateral margins rather narrow, without setae. *Elytra* with basal margin distinctly but obtusely angulate at humeri; apices simple, nearly as in *cephalum* (below); striae moderately impressed; 3rd interval impunctate. *Legs:* 4th hind-tarsal segment simply emarginate, not lobed; 5th hind-tarsal segment with obvious accessory setae. *Measurements:* length 9.8–10.0; width 3.6–3.8 mm.

Types. Holotype ♂ (Leiden Mus.) and 3 paratypes (1 in M.C.Z. No. 28,673) all from Lake Habbema, Snow Mts., **Neth. N. G.**, 3,300 m. (about 10,725 ft.), Oct. 2, 1938 (Toxopeus).

Measured specimens. The ♂ holotype and 1 ♀ paratype.

Notes. This species is exceptional in *Nebriagonum* in that the head is only moderately large, with vague neck-constriction; the posterior angles of the prothorax accurately formed; and the 4th hind-tarsal segment only emarginate, not lobed. However, the species is not too different from some more typical *Nebriagonum* in form; the arrange-

ment of fixed setae (both pairs of supraoculars present, both pairs of lateral pronotals absent, and all punctures of 3rd elytral intervals absent) is the same as in some *Nebriagonum*; it has obvious accessory setae on the 5th hind-tarsal segment as do some *Nebriagonum*; and it probably occupies a habitat like that of *Nebriagonum*, occurring on the open grassy slopes or in the highest forest fringes above Lake Habbema in the Snow Mountains much as *Nebriagonum transitum* occurs on the slopes above Lakes Aunde and Piunde on Mt. Wilhelm. I think that *subcephalum* probably is genetically a *Nebriagonum* but that it is less closely related to any of the species of the Bismarck Range than the latter are to each other.

Nebriagonum cephalum n. sp.

Description. With characters of genus as described above. Form as figured (Fig. 12). *Head* appearing wider than prothorax but actually a little narrower, .96 & .90 as wide in measured specimens; eyes small, only moderately prominent; both pairs of supraocular setae present; genae as long or longer than eyes, convex in profile; neck-constriction rather deep; front usually with irregular impressions behind normal anterior ones. *Prothorax* small, appearing longer than wide but by measurement slightly wider; width/length 1.09 & 1.07, with greatest width about ⅓ behind apex; base/apex 1.03 & 1.02 if base measured across posterior setae, but base narrower if measured at apparent posterior angles; anterior angles hardly at all produced; sides irregularly, rather weakly arcuate, usually slightly sinuate before and subangulate at posterior-lateral setae, and then extended backward and slightly or strongly inward to narrowly rounded apparent posterior angles; lateral margins narrow, each with usual 2 setae in most cases, but posterior setae missing (not broken off) on one or both sides in several individuals. *Elytra* with basal margin distinctly but very obtusely angulate at humeri; apices irregularly broadly rounded to near sutural angles; latter narrowly rounded; striae moderately impressed; each 3rd interval with usually 3 or 4 (sometimes only 2) dorsal punctures irregularly placed as to both length and width of interval, and often very differently arranged on opposite elytra of one individual. *Legs:* 4th hind-tarsal segment lobed; 5th hind-tarsal segment without obvious accessory setae. *Male copulatory organs* as figured (Fig. 59). *Measurements:* length 7.7–9.4; width 2.8–3.3 mm.

Types. Holotype ♂ (M.C.Z. No. 28,674) and 62 paratypes all from Mt. Wilhelm, Bismarck Range, **N-E. N. G.**, Oct. 1944 (Darlington). The type and 21 paratypes are from above the forest line (above 10,000 ft.) and 5 additional paratypes are from still higher, about

14,000 ft., not far below the rocky summit of the mountain, which I suppose to be 15,400 ft. high. The remaining 36 paratypes are from the forest zone between 7,000 & 10,000 ft. Actually all the specimens were taken along the Chim River or its highest tributaries, beside the running water, in and above the forest zone, or in seepage areas at still higher altitudes.

Measured specimens. The ♂ holotype and 1 ♀ paratype with same data.

Notes. Both the structure and habits of this species have been compared with those of other members of the genus in the generic discussion, above.

Nebriagonum percephalum n. sp.

Description. With characters of genus as described above. Larger and a little more slender than the preceding (*cephalum*). *Head* appearing wider than prothorax, but actually only .95 & .93 as wide; eyes small, more abruptly prominent than in *cephalum*; posterior supraocular setae present, anterior ones absent except present on right side in one individual; genae longer than eyes, strongly convex in profile; neck-constriction strongly marked; front conspicuously impressed between eyes, the impressed area divided into about 4 poorly defined, more or less longitudinal parts. *Prothorax* elongate, appearing much longer than wide but actually about as long; width/length .99 & 1.04; base/apex 1.03 & 1.08; anterior angles a little prominent anteriorly; sides very broadly and slightly arcuate, more or less strongly sinuate before nearly right but slightly blunted or very narrowly rounded posterior angles; lateral margins narrow, without setae. *Elytra* with basal margin strongly (obtusely to almost rectangularly) angulate at humeri; apices simple, as in *cephalum*; striae deeply impressed at least at sides of elytra; 3rd intervals impunctate. *Legs:* 4th hind-tarsal segment lobed; 5th hind-tarsal segment without obvious accessory setae. *Measurements:* length 9.3–10.5; width 3.1–3.6 mm.

Types. Holotype ♂ (M.C.Z. No. 28,675) and 11 paratypes all from Mt. Wilhelm, Bismarck Range, **N-E. N. G.**, Oct. 1944 (Darlington). The type and 10 paratypes are from the forest zone between 7,000 & 10,000 ft.; 1 paratype, from above the forest (above 10,000 ft.). Actually all were taken on the banks of the Chim River or its tributaries, in company with *cephalum*.

Measured specimens. The ♂ holotype and 1 ♀ paratype.

Notes. This species is sufficiently discussed and compared under the genus and in the key to species of *Nebriagonum*.

Nebriagonum transitum n. sp.

Description. With characters of genus as described above. Slightly stouter than any of the preceding species, very convex, almost like a stout *Broscus* in appearance. *Head* .82 & .82 width prothorax; eyes small, rather abruptly prominent; genae longer than eyes, convex in profile; both pairs supraocular setae present; neck-constriction well marked, moderately impressed above; front rather lightly impressed (4 poorly defined impressions) between eyes. *Prothorax* of moderate size; width/length 1.12 & 1.13; base about wide as apex (angles too rounded to measure base exactly); anterior angles slightly advanced; sides more arcuate and much more converging posteriorly than in *cephalum*, straight or slightly sinuate before obtuse, rather narrowly rounded basal angles; lateral margins narrow, without setae. *Elytra* with basal margin vaguely or distinctly (but very obtusely) angulate at humeri; apices simple, about as in *cephalum*; striae lightly impressed; dorsal punctures of 3rd elytral intervals variable, rarely entirely absent, anterior puncture usually present on one or both elytra and posterior one often present on one or both elytra too, but middle puncture rarely if ever present. *Legs:* 4th hind-tarsal segment lobed; 5th hind-tarsal segment usually with small but distinct accessory setae (usually about 2 each side of segment, but in some cases they are broken off or possibly absent). *Measurements:* length 8.4–10.3; width 3.1–3.7 mm.

Types. Holotype ♂ (M.C.Z. No. 28,676) and 48 paratypes all from Mt. Wilhelm, Bismarck Range, **N-E. N. G.**, Oct. 1944 (Darlington); the type and 36 paratypes are from open grassy slopes above 10,000 ft.; the remaining 12 paratypes, from forest between 7,000 & 10,000 ft. (presumably from the upper forest fringes).

Measured specimens. The ♂ holotype and 1 ♀ paratype with the same data.

Notes. This species is discussed under the genus and defined in the key to species of *Nebriagonum*.

Nebriagonum transitior n. sp.

Description. With characters of genus as described above. Larger and more slender than the preceding (*transitum*), with a faint purple tinge on elytra not present in other species of genus. *Head* .84 & .83 width prothorax; eyes small, rather abruptly prominent; genae longer than eyes, convex in profile; both pairs supraocular setae present; neck-constriction moderately impressed above; front with 4 slight impressions between eyes. *Prothorax* long; width/length .98 & 1.01; base about wide as apex; anterior angles scarcely at all prominent;

sides rather weakly arcuate for much of length, rather strongly converging and straight or slightly sinuate posteriorly; posterior angles obtuse, rather narrowly rounded; lateral margins moderate (wider than in preceding forms) but scarcely wider posteriorly than anteriorly and not much reflexed, without setae. *Elytra* with basal margin moderately though somewhat obtusely angulate at humeri; apices simple, about as in *cephalum*; striae rather lightly impressed; 3rd intervals impunctate in all specimens. *Legs:* 4th hind-tarsal segment lobed; 5th hind-tarsal segment with several obvious accessory setae each side. *Male copulatory organs:* Fig. 60. *Measurements:* length 11.3–11.9; width 3.7–4.0 mm.

Types. Holotype ♂ (M.C.Z. No. 28,677) and 5 paratypes all from Mt. Wilhelm, Bismarck Range, **N-E. N. G.**, 7,000–10,000 ft. (in forest), Oct. 1944 (Darlington).

Measured specimens. The ♂ holotype and 1 ♀ paratype.

Notes. This species too has been discussed and compared under the genus and in the key to species of *Nebriagonum*.

Nebriagonum arboreum n. sp.

Description. With characters of genus as described above. Still larger than preceding (*transitior*), with elytra less convex, more elongate, and more narrowed toward humeri. *Head* .79 & .78 width prothorax; eyes rather small, not abruptly prominent, almost continuing lines of genae; latter long as or slightly longer than eyes, slightly convex in profile; both pairs supraocular setae present; neck-constriction distinct but not much impressed above; front scarcely impressed between eyes behind usual anterior impressions. *Prothorax* long; width/length .99 & 1.06; base appearing slightly narrower than apex, but posterior angles too rounded for accurate measurement of base; anterior angles slightly advanced; sides broadly arcuate anteriorly, strongly converging from about anterior ⅓ toward base, slightly sinuate before broadly rounded posterior angles; lateral margins rather wide (wider than in *transitior*) but scarcely wider posteriorly than anteriorly, moderately reflexed, without setae; base broadly, slightly arcuate or lobed, the lobe smoothly rounded into posterior angles. *Elytra* rather long and slender, much narrowed anteriorly, less convex than usual in genus; basal margin strongly but not quite rectangularly angulate at humeri; apices each with a very short, stout spine about opposite 3rd or 4th interval, base of spine running sinuously but smoothly into both lateral and sutural margins of elytron, without other angulation; striae very lightly impressed, irregular or faintly punctulate; 3rd interval of ♂ type with only posterior puncture

present, near top of declivity on each elytron, of ♀ paratype with only posterior puncture on left elytron but middle and posterior ones on right elytron. *Legs:* 4th hind-tarsal segment lobed; 5th hind-tarsal segment with a row of conspicuous accessory setae each side. *Measurements:* length (♂ ♀) 12.9–14.3; width 4.2–4.8 mm.

Types. Holotype ♂ (M.C.Z. No. 28,678) and 1 ♀ paratype both from Mt. Wilhelm, Bismarck Range, **N-E. N. G.**, 7,000–10,000 ft. (forest), Oct. 1944 (Darlington).

Measured specimens. The types.

Notes. See again the generic discussion and the key to species of *Nebriagonum*. The copulatory organs of the ♂ type are too unformed to draw.

Laevagonum new genus

Diagnosis. Small (5.5–8.4 mm.), *Europhilus*- or *Calathus*- or cistelid-like; prothorax and elytra with outlines smoothly but more or less independently rounded and with discs smoothly convex; basolateral foveae of pronotum obsolete; wing-and-seta formula −w,++,(−)−,−−−.

Description. Form as indicated above; brown or piceous, with appendages brownish or yellowish; surface moderately shining, not iridescent, nearly impunctate above except elytral intervals often vaguely punctulate; microsculpture normal except only slightly transverse on elytra, usually less so than on pronotum. *Head* small, more or less elongate; eyes more or less reduced in size and only slightly prominent; both pairs supraocular setae present, posterior ones slightly or distinctly behind line of posterior edges of eyes; antennae normal; neck slightly or not impressed above; front convex, with small anterior impressions; mentum tooth triangular with apex more or less blunted. *Prothorax* with sides smoothly rounded for whole length, or sometimes straighter (and of course more or less converging) toward base; lateral margins very narrow, usually without setae but anterior-lateral ones present in *subcitum*; anterior angles more or less distinct, obtuse or narrowly rounded, not produced beyond curve of broadly emarginate anterior edge of prothorax; posterior angles moderately or broadly rounded; disc with usual median line (sometimes very light) but transverse impressions slight or absent; anterior marginal line usually entire but often faint and sometimes interrupted at middle, posterior one faint or widely interrupted or obsolete. *Elytra* with basal margin entire or nearly so, rectangular or nearly so at humeri except only obtusely angulate in *subcitum*; lateral margins more or less narrow; sides forming nearly smooth curves from humeri to apices; subapical sinuations obsolete or nearly so; apices narrowly, more or less independently

rounded, rarely with sutural angles denticulate (*citum* only); striae rather lightly impressed, not distinctly punctate but often irregular or vaguely punctulate; intervals slightly convex, outer ones not much modified toward apex, 3rd impunctate. *Inner wings* vestigial. *Lower surface* impunctate or nearly so; abdomen not pubescent; prosternal process simple. *Legs:* hind tibiae not sulcate along outer edges; 4th hind-tarsal segment emarginate, not lobed; 5th hind-tarsal segment without obvious accessory setae; claws simple. *Secondary sexual characters* normal. *Male copulatory organs* as figured (Figs. 61–63).

Genotype. Laevagonum cistelum n. sp. (below).

Generic distribution. Known only from high altitudes on the Bismarck Range, N-E. N. G.

Notes. The presence of anterior-lateral pronotal setae in one species argues against a derivation of this genus from *Altagonum*. It has perhaps been derived independently from *Notagonum* or from a *Gastragonum*-like ancestor. The species of *Laevagonum,* which are perfectly distinct but obviously rather closely related to each other, constitute another good example (*cf. Nebriagonum*) of apparent speciation in a limited mountainous area. All the species were found in or just above one continuous piece of heavy mountain forest. I have no record of the habitat of *subcitum,* the most distinct of the four, except that it occurred in forest. Of the other three species, *citum,* with the smallest eyes, was found under comparatively deep stones and logs in forest and may be incipiently subterranean; *cistelum,* under various cover on the ground in forest; and *subcistelum,* under cover on the ground in open grassy areas just above the upper edges of the forest. The fact that these species are all flightless is consistent with their apparent isolation in slightly separated habitats. However, it does not necessarily follow that they originated as a result of ecological isolation, as I have already noted in the introduction.

All the species of this genus share many characters covered in the preceding generic description, so their individual descriptions can be brief.

Key to the Species of Laevagonum

1. Anterior-lateral pronotal setae present; elytral margin very obtusely angulate at humeri; (*Europhilus*-like) (p. 245) ..... *subcitum*
– Anterior-lateral (as well as posterior-lateral) pronotal setae absent; elytral margin rectangular or nearly so at humeri 2
2. *Europhilus*-like; slender, prothorax more elongate, width/length .98 & .99; sutural angles of elytra denticulate (p. 245) ..... *citum*
– Cistelid- or *Calathus*-like; prothorax shorter, width/length 1.15 to 1.39; sutural angles of elytra not denticulate 3

3. Larger (7.0–8.4 mm.); browner; elytra relatively longer and less rounded (p. 246) ..... *cistelum*
– Smaller (5.5–6.4 mm.); blacker; elytra relatively shorter and more rounded (p. 246) ..... *subcistelum*

Laevagonum subcitum n. sp.

Description. With characters of genus as described above. *Europhilus*-like. *Head* only moderately elongate, .69 & .65 width prothorax; eyes slightly longer than and somewhat more prominent than genae. *Prothorax* subquadrate but with moderately rounded sides; width/length 1.07 & 1.15; base slightly or scarcely wider than apex (angles too rounded for exact measurement of base); anterior-lateral seta (or puncture marking its position) present slightly before middle of prothoracic length on both sides in both specimens. *Elytra* with basal margin only very obtusely angulate at humeri; lateral margins only moderately narrow; apices with sutural angles obtuse, poorly defined, not denticulate. *Male copulatory organs:* Fig. 61. *Measurements:* length 6.3–6.4; width about 2.2 mm.

Types. Holotype ♂ (M.C.Z. No. 28,679) and 1 ♀ paratype both from Mt. Wilhelm, Bismarck Range, **N-E. N. G.**, 7,000–10,000 ft. (forest), Oct. 1944 (Darlington).

Measured specimens. The types.

Notes. Sufficiently compared with other species in key above.

Laevagonum citum n. sp.

Description. With characters of genus as described above. *Europhilus*-like, elongate. *Head* relatively elongate, .63 & .62 width prothorax; eyes as long as or slightly longer than and scarcely or slightly more prominent than genae. *Prothorax* elongate, appearing longer than wide and by measurement very slightly so; width/length .98 & .99; base slightly wider than apex (angles too rounded for exact measurement of base). *Elytra* with basal margin about rectangular at humeri; lateral margins rather narrow; sutural angles usually conspicuously denticulate, but only vaguely so in 1 paratype. *Male copulatory organs:* Fig. 62. *Measurements:* length 7.2–8.4; width 2.4–2.8 mm.

Types. Holotype ♂ (M.C.Z. No. 28,680) and 3 (♀ ♀) paratypes all from Mt. Wilhelm, Bismarck Range, **N-E. N. G.**, 7,000–10,000 ft. (forest), Oct. 1944 (Darlington).

Measured specimens. The ♂ holotype and 1 ♀ paratype.

Notes. This species is distinguished from others in the key above, and its habits are indicated in discussion under the genus.

Laevagonum cistelum n. sp.

Description. With characters of genus as described above. Rather slender *Calathus*- or (even more) cistelid-like (Fig. 13). *Head* small and not very elongate, .53 & .51 width prothorax; eyes longer than genae but scarcely or only slightly more prominent. *Prothorax* strongly narrowed in front, much less so behind; width/length 1.24 & 1.39; base/apex about 1.8 & 1.7 (angles too rounded for exact measurement of base); sides variably, weakly to rather strongly rounded; basal angles also rather variable, moderately to very broadly rounded. *Elytra* with basal margin about rectangular at humeri; lateral margins narrow; apices with sutural angles narrowly rounded or somewhat distinct, but not denticulate. *Male copulatory organs* as figured (Fig. 63). *Measurements:* length 7.0–8.4; width 2.4–2.9 mm.

Types. Holotype ♂ (M.C.Z. No. 28,681) and 9 paratypes all from Mt. Wilhelm, Bismarck Range, **N-E. N. G.**, 7,000–10,000 ft. (forest), Oct. 1944 (Darlington).

Measured specimens. The ♂ holotype and 1 ♀ paratype.

Notes. This too is sufficiently compared with other species in the key above, and its habitat is indicated in notes under the genus.

Laevagonum subcistelum n. sp.

Description. With characters of genus as described above. *Calathus*-like. *Head* small, only moderately elongate, .60 & .62 width prothorax; eyes longer than and a little more prominent than genae. *Prothorax* a little longer and less narrowed in front than in *cistelum*; width/length 1.20 & 1.15; base/apex 1.4, more or less (angles too rounded for exact measurement of base); sides moderately rounded throughout or straighter toward base; basal angles rather broadly rounded. *Elytra* relatively shorter and more rounded than in *cistelum*; basal margin strongly but usually somewhat obtusely angulate at humeri; lateral margins narrow; apices with sutural angles narrowly rounded, or at most faint and obtuse, not denticulate. *Measurements:* length 5.5–6.4; width 2.0–2.3 mm.

Types. Holotype ♂ (M.C.Z. No. 28,682) and 7 paratypes all from Mt. Wilhelm, Bismarck Range, **N-E. N. G.**, slightly above 10,000 ft., Oct. 1944 (Darlington), under cover in open grassy places a little above the forest line.

Measured specimens. The ♂ holotype and 1 ♀ paratype.

Notes. Adequately compared in key above, and mentioned also in discussion under the genus.

FORTAGONUM new genus

Diagnosis. Moderate-sized (8.8–12.4 mm.), heavily built, broadly subparallel or fusiform, more or less strongly convex; inner wings vestigial; wing-and-seta formula −w, −(+), −−, (−) (−) (−) (note anterior supraoculars absent).

Description. Form as indicated above; black or brownish-black, elytra sometimes more or less iridescent or purplish; lateral margins of prothorax and elytra not distinctly translucent; appendages piceous or reddish; upper surface moderately shining; microsculpture more or less normal, but differing in detail in different species. *Head* variable; mandibles sometimes (not always) strikingly long, slender, and nearly straight; eyes more or less reduced but very variable in prominence; anterior supraocular setae absent, posterior ones present except absent in *bufo*, slightly behind or almost between posterior edges of eyes; antennae normal; neck not impressed above; front variable; mentum tooth triangular, sometimes more or less blunted or subtruncate at tip. *Prothorax* with anterior angles broadly and strongly advanced, with apices right-acute except as blunted or narrowly rounded; lateral margins wide at least basally but sometimes not sharply differentiated from disc; lateral pronotal setae absent; basal foveae obsolete or nearly so, scarcely distinct from wide basal parts of margins; base more or less normal; anterior marginal line entire, posterior one faint or obsolete. *Elytra* always broad at base and usually rather short, not impressed on disc; variable in many details but always more or less narrowly margined at sides, with apices not armed; striae moderately to rather deeply impressed, impunctate; a more or less distinct partial 10th interval often (not always) present posteriorly. *Inner wings* vestigial. *Lower surface* impunctate or partly punctate; abdomen not pubescent; prosternal process usually simple, but margined and tuberculate at apex in *bufo*. *Legs:* hind tibiae not sulcate along extreme outer edges; 4th hind-tarsal segment emarginate or moderately lobed; 5th hind-tarsal segment without obvious accessory setae, but sometimes (at least in some *fortellum*) with minute rudimentary ones (as in many other New Guinean Agonini). *Secondary sexual characters* normal. *Male copulatory organs* as figured (Figs. 64–66).

Genotype. Fortagonum fortellum n. sp. (below).

Generic distribution. High mountains of New Guinea.

Notes. This is an apparently natural group of surprisingly diverse species, of which many more probably remain to be discovered at high altitudes on different mountain ranges.

Key to the Species of Fortagonum

1. Prothoracic margins very wide anteriorly as well as posteriorly; elytral margin rounded at humeri; elytra purplish; (form very broadly subquadrate; eyes small but very abruptly prominent) (p. 248) . . . . . *limum*
- Prothoracic margins very narrow anteriorly, very wide only posteriorly; elytral margins abruptly angulate at humeri; elytra not purplish; (form and eyes variable) 2
2. Eyes small and scarcely more prominent than genae; mandibles long, slender, only slightly arcuate 3
- Eyes small but rather prominent, much more so than genae; mandibles variable but never so produced as above 4
3. Rather broadly subparallel; basal margin of elytra entire (p. 249) . . *forceps*
- Oval-fusiform; basal margin of elytra joining bases of 3rd striae, obliterated inwardly (p. 250) . . . . . *cychriceps*
4. Posterior supraocular setae present; form moderately broad, not fusiform (p. 251) . . . . . *fortellum*
- Posterior (as well as anterior) supraocular setae absent; form very broadly rounded-fusiform (p. 252) . . . . . *bufo*

Fortagonum limum n. sp.

Description. With characters of genus as described above. Very broadly subquadrate; elytra inconspicuously purplish, not iridescent; upper surface (at 54×) finely and sparsely punctulate, with some additional coarser but rather superficial punctation on lateral margins of prothorax; microsculpture normal. *Head* relatively small but with neck thick and swollen; head about .47 width prothorax; mandibles not especially elongate; eyes small but excessively prominent; front conspicuously, irregularly, transversely impressed between eyes, and anterior frontal impressions extending backward into very deep channels above and behind eyes. *Prothorax* very wide; width/length about 1.78; base/apex about 1.33; sides strongly rounded for most of length, becoming nearly straight near base; posterior angles obtuse, slightly blunted; lateral margins very wide anteriorly as well as posteriorly, moderately reflexed; disc with light median line and vague transverse impressions. *Elytra* broad and relatively short, rather strongly convex; humeri broad but prominently rounded rather than pointed; basal margin entire, rounded rather than angulate at humeri; sides straight and probably subparallel to behind middle, then strongly arcuate to distinct but not strong subapical sinuations; apices rather narrowly independently rounded; intervals a little convex, not much modified toward apex; marginal (10th) interval narrow and poorly defined; 3rd interval impunctate on left elytron, 1-punctate (just behind middle) on right one. *Lower surface* impunctate or nearly so,

but epipleurae roughened. *Legs:* 4th hind-tarsal segment with moderate outer and much shorter inner lobe. *Measurements:* length 11.0; width about 4.8 mm.

Type. Holotype ♀ (M.C.Z. No. 28,683) from Mt. Misim, Morobe Dist., **N-E. N. G.**, altitude and date not given (Stevens).

Measured specimen. The type.

Notes. The single specimen of this species is partly crushed, with the prothorax split lengthwise, so that the measurements and proportions given are only approximate. The species has the generic characters of *Fortagonum* and is probably related to the other species here placed in that genus, but it differs from all the others in a number of striking characters: color of elytra, excessive prominence of eyes, form of front of head, form of prothorax (with margins very wide anteriorly as well as posteriorly), and form of humeri (rounded rather than pointed).

Fortagonum forceps n. sp.

Description. With characters of genus as described above. Rather broadly subparallel; upper surface impunctate except very finely and sparsely punctulate, rather shining, elytra somewhat iridescent in strong light only; microsculpture normal, with elytral meshes very fine and transverse. *Head* .57 & .56 width prothorax; mandibles unusually long, slender, and only slightly arcuate; eyes small and only slightly more prominent than genae; latter about as long as eyes, convex in profile; front moderately convex, more or less impressed transversely between eyes, with anterior impressions moderate and extending vaguely backward above eyes but not forming deep channels there. *Prothorax:* width/length 1.28 & 1.35; base/apex about 1.33 & 1.35; sides rather weakly arcuate for much of length, straighter posteriorly; posterior angles a little obtuse, narrowly rounded; lateral margins relatively narrow anteriorly, very wide posteriorly, flat, only slightly reflexed; disc with median line moderately impressed, transverse impressions almost obsolete. *Elytra* broad and rather short, only a little more than normally convex; basal margin entire, strongly advanced and acute at humeri; subapical sinuations faint or absent; apices rather narrowly, more or less conjointly rounded (a little more independently rounded in the ♀ paratype); intervals moderately convex, not much modified toward apex; an extra (10th) interval present for much of elytral length, moderately wide, flat or slightly convex; 3rd interval impunctate. *Male copulatory organs:* Fig. 64. *Lower surface* impunctate. *Legs:* 4th hind-tarsal segment emarginate, not lobed. *Measurements:* length 12.4; width 4.8–4.9 mm.

Types. Holotype ♂ (Leiden Mus.) and 1 ♀ paratype (M.C.Z. No. 28,684) both from Moss Forest Camp, Snow Mts., **Neth. N. G.**, 2,600–2,800 m. (about 8,450–9,100 ft.), Oct. 9–Nov. 5, 1938 (Toxopeus)

Measured specimens. The types.

Notes. Sufficiently compared with other species in the key above. This and the following species (*cychriceps*) are unique among New Guinean Agonini in the form of their mandibles which may be adapted to feeding on small snails or some other special food. The present species, except that it is larger, superficially resembles *F. fortellum* (below) of the Bismarck Range, but *fortellum* has approximately normal mandibles and differs in other technical details.

Fortagonum cychriceps n. sp.

Description. With characters of genus as described above. Oval-fusiform; upper surface virtually impunctate except lateral margins of prothorax vaguely punctulate; shining, head and pronotum opalescent or slightly iridescent, elytra more iridescent; microsculpture normal on head, very fine, transverse, and scarcely visible at 54× on pronotum and elytra. *Head* relatively long and narrow, .48 width prothorax; mandibles long, slender, only weakly arcuate; eyes small, scarcely more prominent than genae; latter about as long as eyes, only faintly convex in profile; front convex, obliquely flattened above eyes, with slight, almost indistinct frontal impressions. *Prothorax* widest very near base, strongly narrowed anteriorly; width/length 1.27; base/apex about 1.8; sides weakly arcuate for whole length; posterior angles would be right except narrowly rounded; lateral margins very narrow anteriorly, very wide basally, even less reflexed (more nearly in plane of disc) than in other species of genus; disc more convex than usual, with median line lightly impressed, transverse impressions almost obsolete. *Elytra* relatively longer than in other species of genus, rather gradually tapering posteriorly, more convex than usual; basal margin reaching and joining ends of 3rd striae but obsolete inwardly, strongly advanced and acute at humeri; sides almost evenly rather weakly arcuate from humeri to apices, without subapical sinuations; apices somewhat independently rounded; striae deeper and intervals more convex than usual; outer intervals not much modified toward apex; marginal (10th) interval present for most of elytral length, rather wide especially posteriorly, nearly flat; 3rd interval impunctate. *Lower surface* virtually impunctate. *Legs:* 4th hind-tarsal segment emarginate, not lobed. *Measurements:* length 11.5; width 4.3 mm.

Type. Holotype ♀ (Leiden Mus.) from Mist Camp, Snow Mts., **Neth. N. G.**, 1,800 m. (about 5,850 ft.), Jan. 1939 (Toxopeus); unique.

Measured specimen. The type.

Notes. Adequately characterized and compared with other species in the key above.

Fortagonum fortellum n. sp.

Description. With characters of genus as described above. Not fusiform (Fig. 14); upper surface impunctate (except elytral intervals sparsely punctulate at 54×), moderately shining, elytra faintly iridescent in strong light only; microsculpture normal except so fine as to be scarcely visible on elytra. *Head* rather small and narrow, .54 & .55 width prothorax; mandibles not especially long; eyes rather small, moderately prominent; genae about as long as eyes, oblique; front almost evenly convex, with very slight anterior impressions. *Prothorax* widest behind middle, strongly narrowed in front, much less so behind; width/length 1.41 & 1.44; base/apex 1.47 & 1.42; sides broadly, almost evenly arcuate for whole length, or sometimes vaguely straighter both anteriorly and posteriorly; posterior angles a little obtuse, narrowly rounded; lateral margins relatively narrow anteriorly, very wide posteriorly, flat, scarcely reflexed; disc with middle line light, transverse impressions virtually obsolete. *Elytra* broad and rather short but otherwise of nearly normal outline in tribe; sides slightly arcuate at middle, more strongly so apically; disc a little more than normally convex; basal margin entire, about rectangular at humeri; subapical sinuations absent; apices conjointly rounded to obtuse, blunted, slightly dehiscent sutural angles; intervals flat or slightly convex, very variable toward apex, outer ones sometimes not much modified, or 8th and 9th and sometimes others deeply longitudinally impressed toward apex; variable short fragment of extra 10th interval present in some specimens absent in others, when present, convex and sharply defined, at outer apical curve of elytron; 3rd interval variably punctate (*e.g.* type has left 3rd interval normally 3-punctate except middle puncture is farther forward than usual, right 3rd interval 3-punctate with all punctures at 2nd stria; second measured specimen has left 3rd interval 2-punctate with punctures at 2nd stria about $\frac{2}{5}$ from base and $\frac{1}{4}$ from apex, and right 3rd interval 1-punctate with puncture at 2nd stria about $\frac{1}{3}$ from base). *Lower surface* with sides of sterna superficially punctate. *Legs:* 4th hind-tarsal segment emarginate, not lobed. *Male copulatory organs* as figured (Fig. 65). *Measurements:* length 8.8–10.8; width 3.7–4.4 mm.

Types. Holotype ♂ (M.C.Z. No. 28,685) and 53 paratypes all from Mt. Wilhelm, Bismarck Range, **N-E. N. G.**, 7,000–10,000 ft., Oct. 1944 (Darlington), taken in and under various cover on the ground in heavy forest.

Measured specimens. The ♂ holotype and 1 ♀ paratype.

Notes. This is, of course, a thoroughly characterized species, distinguished from others in the key above. The variation in form of the outer elytral intervals (variably impressed or not impressed), in presence or absence of a variable fragment of a 10th interval, and in punctures of the 3rd interval is amazing, but the variation is erratic, with the different characters not correlated, and the whole series is from a limited area of continuous forest and has the look and in many ways the characters of a single population, which I have no doubt it is.

Fortagonum bufo n. sp.

Description. With characters of genus as described above. Very broadly oval, very convex; upper surface virtually impunctate, only moderately shining, not iridescent; microsculpture normal. *Head* .49 & .51 width prothorax; mandibles somewhat longer and straighter than usual, but less so than in *forceps* and *cychriceps*; eyes small, rather prominent, but much less so than in *limum*; genae short and oblique; front convex, with slight anterior impressions. *Prothorax* widest in basal half, strongly narrowed anteriorly, not or scarcely so posteriorly; width/length 1.52 & 1.48; base/apex about 1.73 & 1.56; sides slightly sinuate behind anterior angles, then moderately arcuate, then straighter and subparallel toward base; basal angles nearly right, blunted; lateral margins very narrow anteriorly, very wide posteriorly, strongly flattened posteriorly but scarcely reflexed; disc strongly convex, with middle line moderately impressed, transverse impressions almost obsolete. *Elytra* widest well behind humeri, very convex, with strongly rounded sides; basal margin entire, a little obtusely (almost rectangularly) angulate at humeri; subapical sinuations slight or virtually absent; apices rather abruptly rounded (almost subangulate) about opposite 2nd striae, with sutural angles obtuse; striae rather deep; intervals moderately convex, not much modified toward apex; no distinct extra (10th) interval; 3rd interval impunctate. *Lower surface* with sides of mesosternum rather lightly punctate. *Legs:* 4th hind-tarsal segment with a moderate outer and slightly shorter inner lobe. *Male copulatory organs:* Fig. 66. *Measurements:* length 10.4–11.3; width 5.0–5.2 mm.

Types. Holotype ♂ (Leiden Mus.) and 1 ♀ paratype (M.C.Z. No. 28,686) both from Mist Camp, Snow Mts., **Neth. N. G.**, 1,800 m. (about 5,850 ft.), Jan. 1939 (Toxopeus).

Measured specimens. The types.

Notes. This species is unique among New Guinean Agonini in form as well as in absence of both pairs of supraocular setae.